

FIG. 1 PRIOR ART

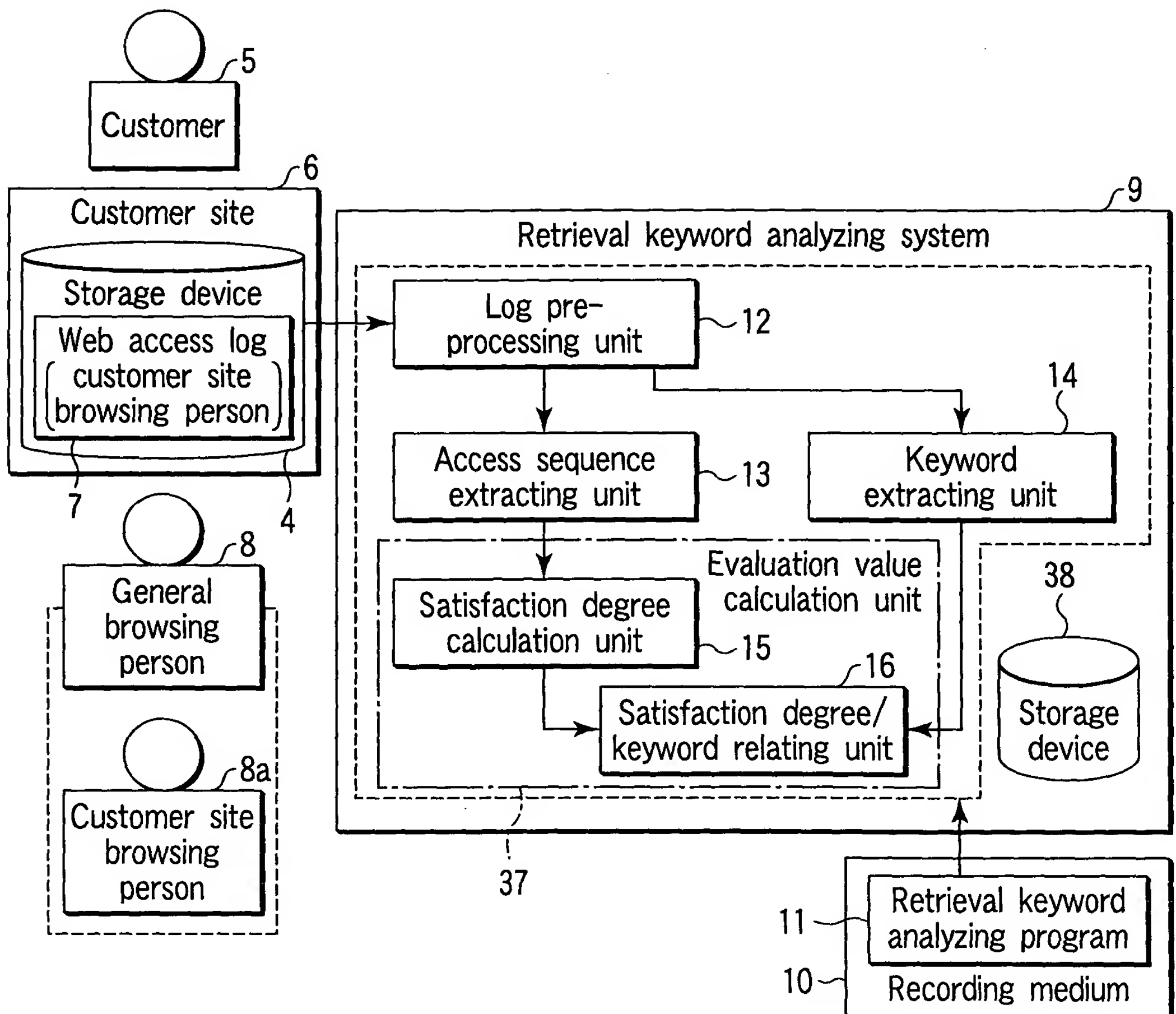


FIG. 2

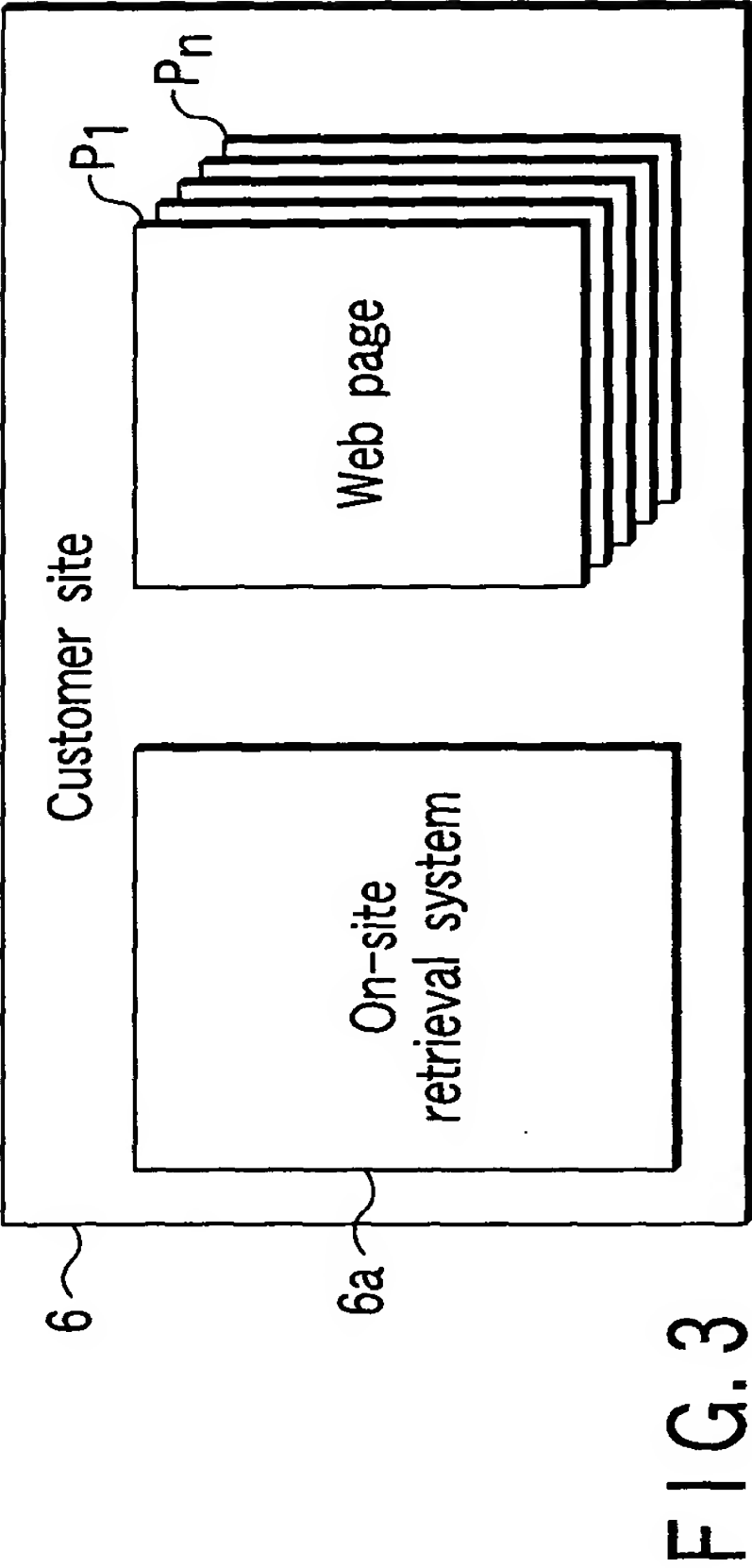


FIG. 3

Information contained in Web access log (customer site browsing person)

Host name	User ID	Date	Time	Request	End code	Number of transferred bytes	Reference information	User agent
pc001.○○○.co.jp	—	2002/2/14	18:56:14	/index.html	200	400	—	Mozilla/4.0 (compatible:MOIE...
ws20.△△△.co.jp	—	2002/2/14	18:57:30	/cgi/login.cgi	200	700	—	Mozilla/4.7 [ΔΔ5LLL](X11...
pc001.○○○.co.jp	—	2002/2/14	18:58:01	/products/index.html	200	2400	—	wΔm/0.3+m□e-p21-26+m○e-1.5.2
pc001.○○○.co.jp	—	2002/2/14	18:58:40	products/info/p001.pdf	200	3000	—	Mozilla/4.7 [ΔΔ5LLL](X11...
ws20.△△△.co.jp	—	2002/2/14	18:59:10	/cgi/order.cgi	200	700	—	Mozilla/4.0 (compatible:MOIE...

FIG. 4

Pre-processed data

View ID	Host name	User ID	Date	Time	Request	Reference information	User agent
View 1	pc001.○○○.co.jp	—	2002/2/14	18:56:14	/index.html	—	Mozilla/4.0 (compatible:MOIE…
View 2	ws20.△△△.co.jp	—	2002/2/14	18:57:30	/cgi/login.cgi	—	Mozilla/4.7 [△△5LLL](X11…
View 3	pc001.○○○.co.jp	—	2002/2/14	18:58:01	/products/index.html	—	w△m/0.3+m□e-p21-26+mOe-1.5.2
View 4	pc001.○○○.co.jp	—	2002/2/14	18:58:40	products/info/p001.pdf	—	Mozilla/4.7 [△△5LLL](X11…
View 5	ws20.△△△.co.jp	—	2002/2/14	18:59:10	/cgi/order.cgi	—	Mozilla/4.0 (compatible:MOIE…

FIG. 5

Access sequence data

View ID	Visit ID	Visitor ID	Date	Time	Request
View 1	Visit 1	Visitor 1	2002/2/14	18:56:14	/AAA.html
View 2	Visit 2	Visitor 2	2002/2/14	18:57:30	/BBB.cgi
View 3	Visit 1	Visitor 1	2002/2/14	18:58:01	/CCC.html
View 4	Visit 2	Visitor 2	2002/2/14	18:58:40	/GGG/DDD.cgi
View 5	Visit 3	Visitor 1	2002/2/14	19:42:10	/EEE.html

FIG. 6

Request to retrieval system

Example 1	http://www.○○○.co.jp/search.cgi?q=xxx
Example 2	http://www.○○○.co.jp/search.cgi?q=yyy&page=10
Example 3	http://www.○○○.co.jp/search.cgi?q=%E3%82%8A%E3%82%93%E3%81%94

FIG. 7

Place of retrieval system and query pattern

FIG. 8

Place of retrieval system	Query pattern
http://www.〇〇〇.co.jp/search.cgi	q

Extracted parameter

FIG. 9

	Query pattern
Example 1	xxxx
Example 2	yyyy
Example 3	%E3%82%8A%E3%82%93%E3%81%94

Keyword data

FIG. 10

View ID	Retrieval keyword
View 6	りんご
View 21	apple
View 43	banana
View 56	砂糖
View 81	カレイ

After-retrieval browsing time
and satisfaction degree

After-retrieval browsing time	Satisfaction degree
No viewing	0
Browsing only one page	0
Less than 1 minute	10
1 to 2 minutes	20
2 to 3 minutes	30
3 to 5 minutes	40
5 to 7 minutes	50
7 to 10 minutes	60
10 to 15 minutes	70
15 to 20 minutes	80
20 to 25 minutes	90
30 minutes or more	100

FIG. 11

Access sequence data

View ID	Visit ID	Satisfaction degree data
View 1	Visit 1	0
View 2	Visit 2	20
View 3	Visit 1	0
View 4	Visit 2	20
View 5	Visit 3	10

FIG. 12

Relation between satisfaction degree data and keyword data

View ID	Satisfaction degree data	Retrieval keyword
View 6	10	りんご
View 21	0	apple
View 83	30	りんご
View 121	20	砂糖
View 137	0	apple

FIG. 13

Relation data

Retrieval keyword	Satisfaction degree data
りんご	23.4
apple	17.8
砂糖	2.4
肉野菜	2.4
蜂蜜	11.6

FIG. 14

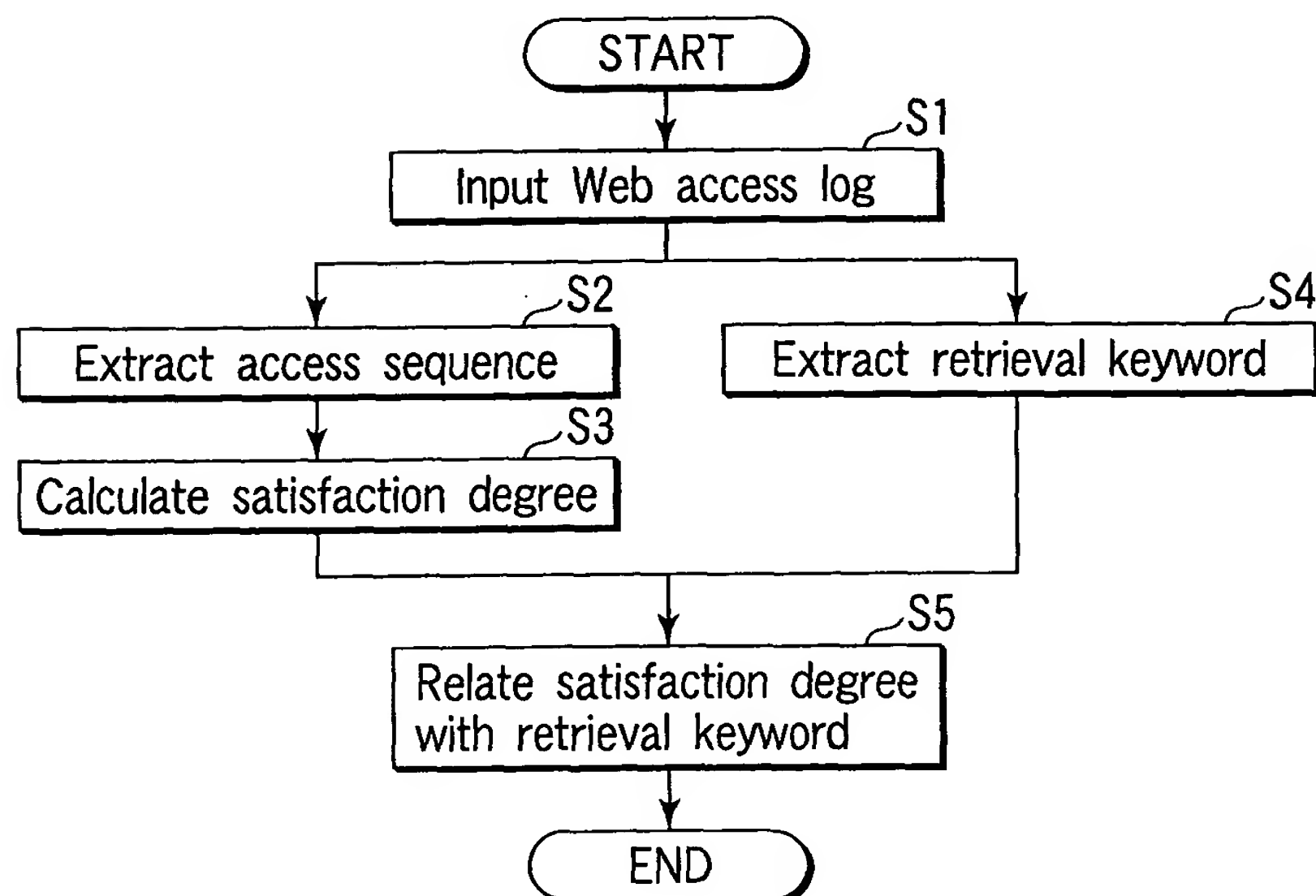


FIG. 15

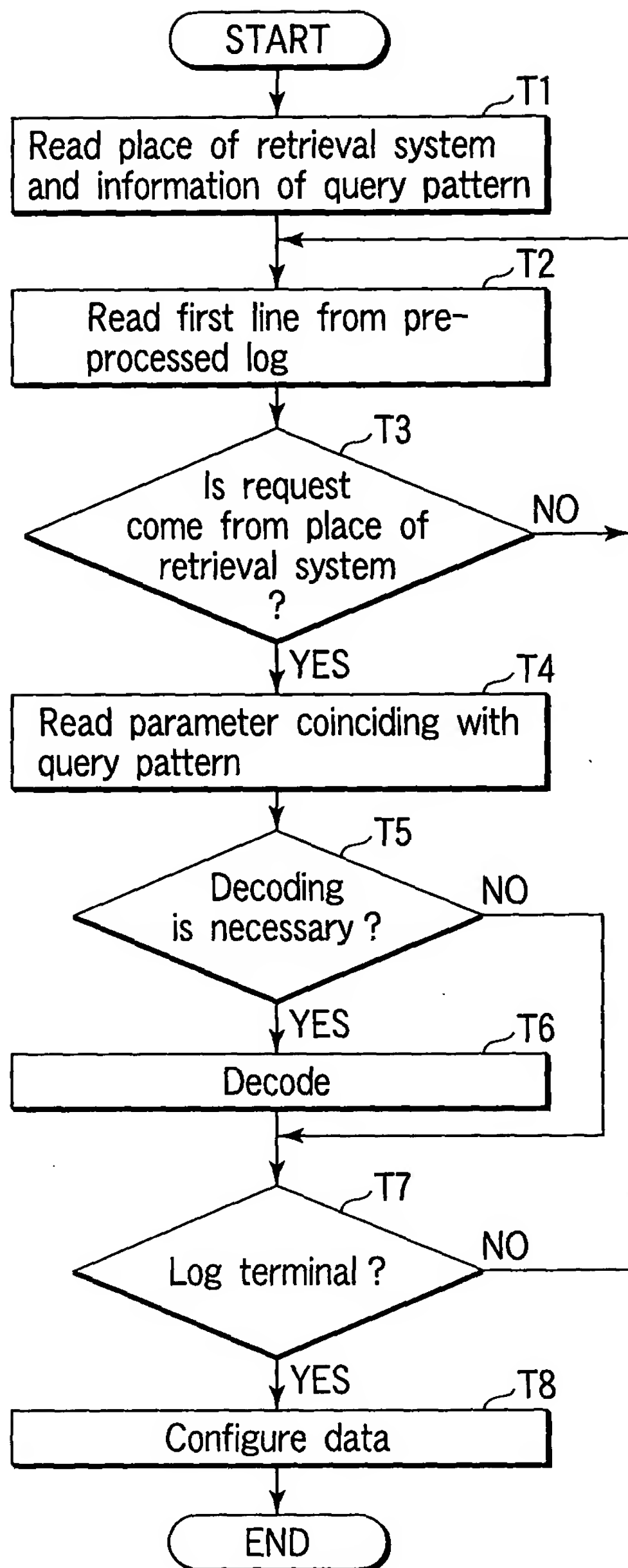


FIG. 16

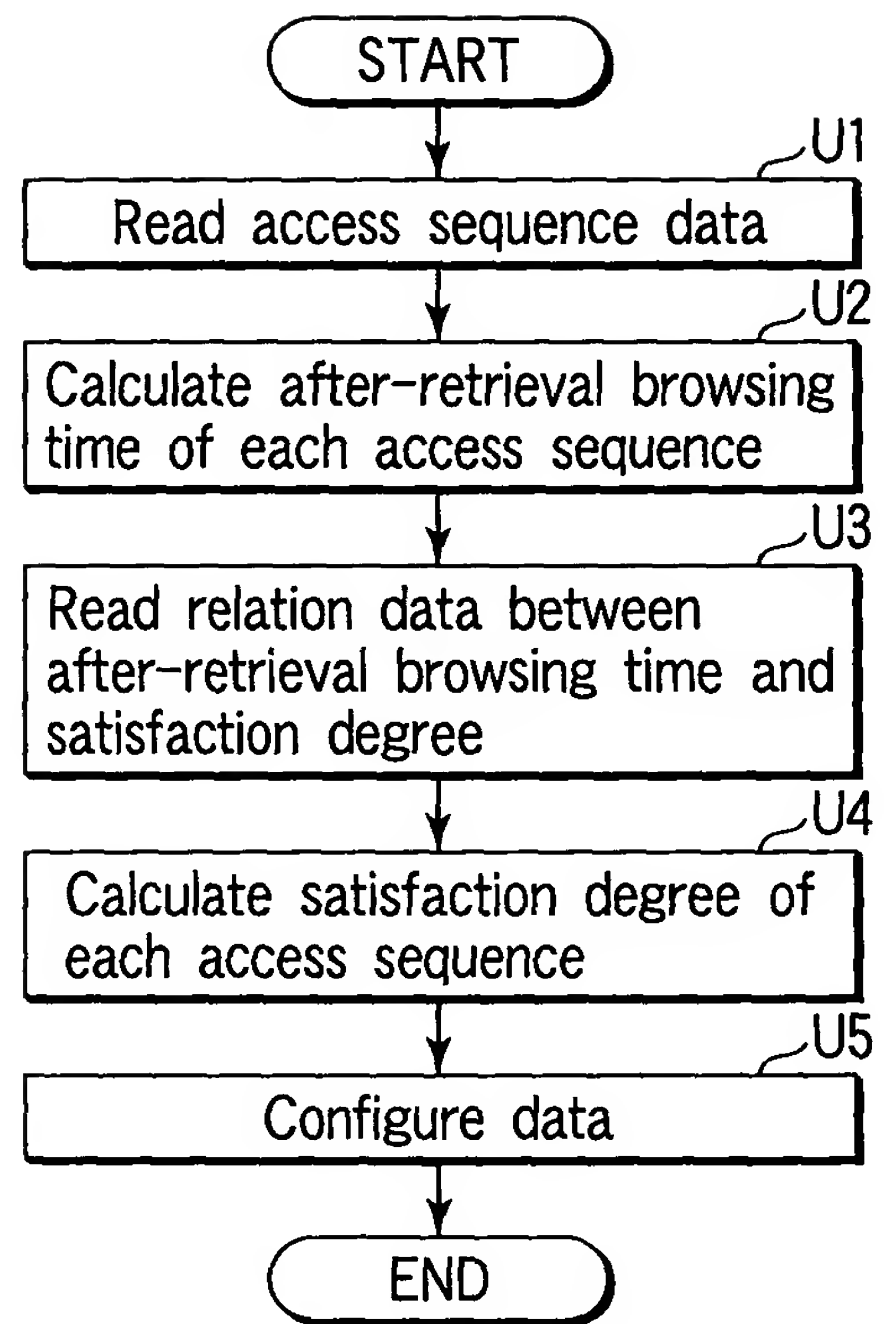


FIG. 17

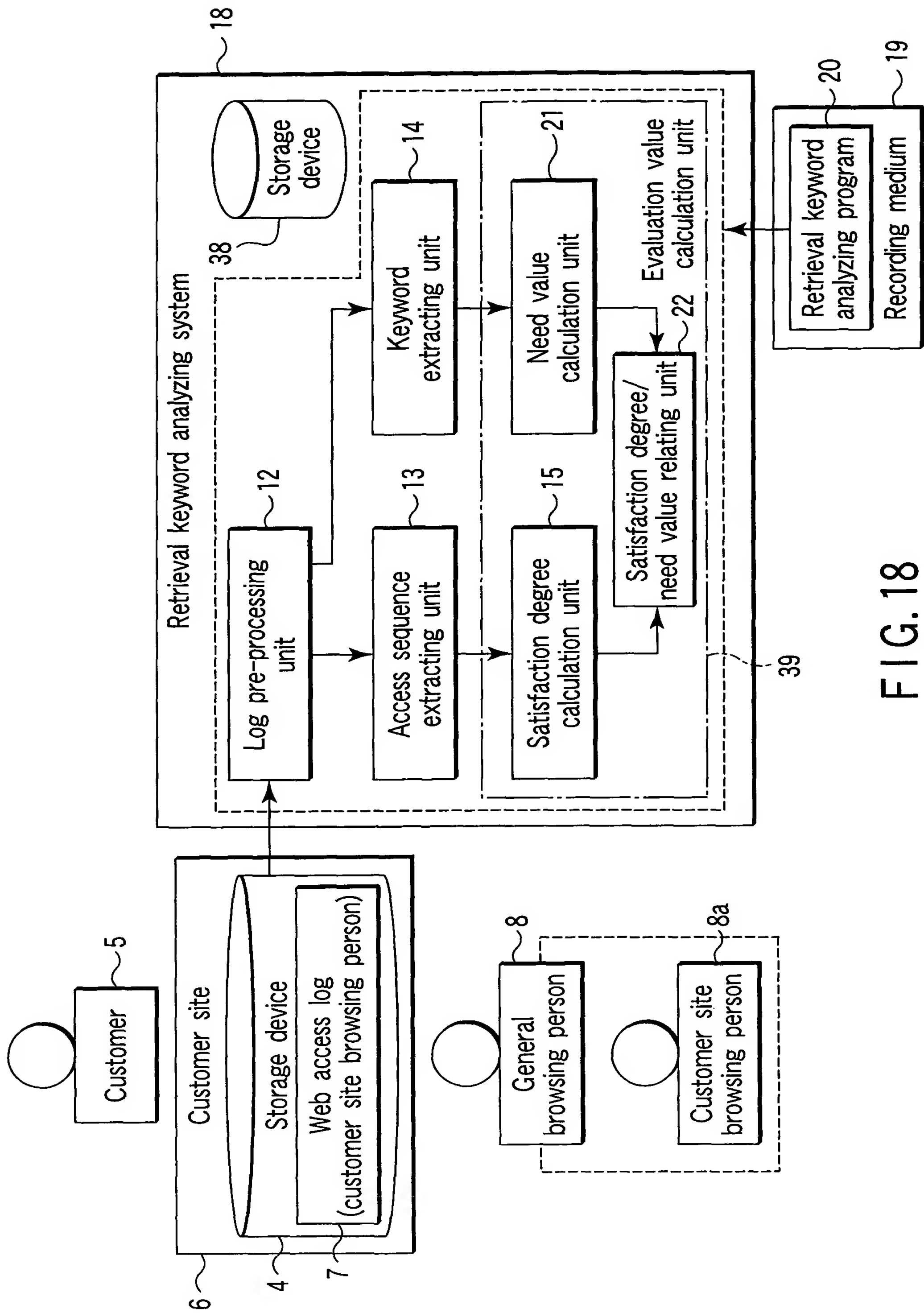


FIG. 18

Need value data

Retrieval keyword	Need value
りんご	21.5
apple	14.6
砂糖	3.6
肉野菜	17.6
蜂蜜	2.7

FIG. 19

Relation data

Retrieval keyword	Need value	Satisfaction degree
りんご	21.5	23.4
apple	14.6	17.8
砂糖	3.6	2.4
肉野菜	17.6	2.4
蜂蜜	2.7	11.6

FIG. 20

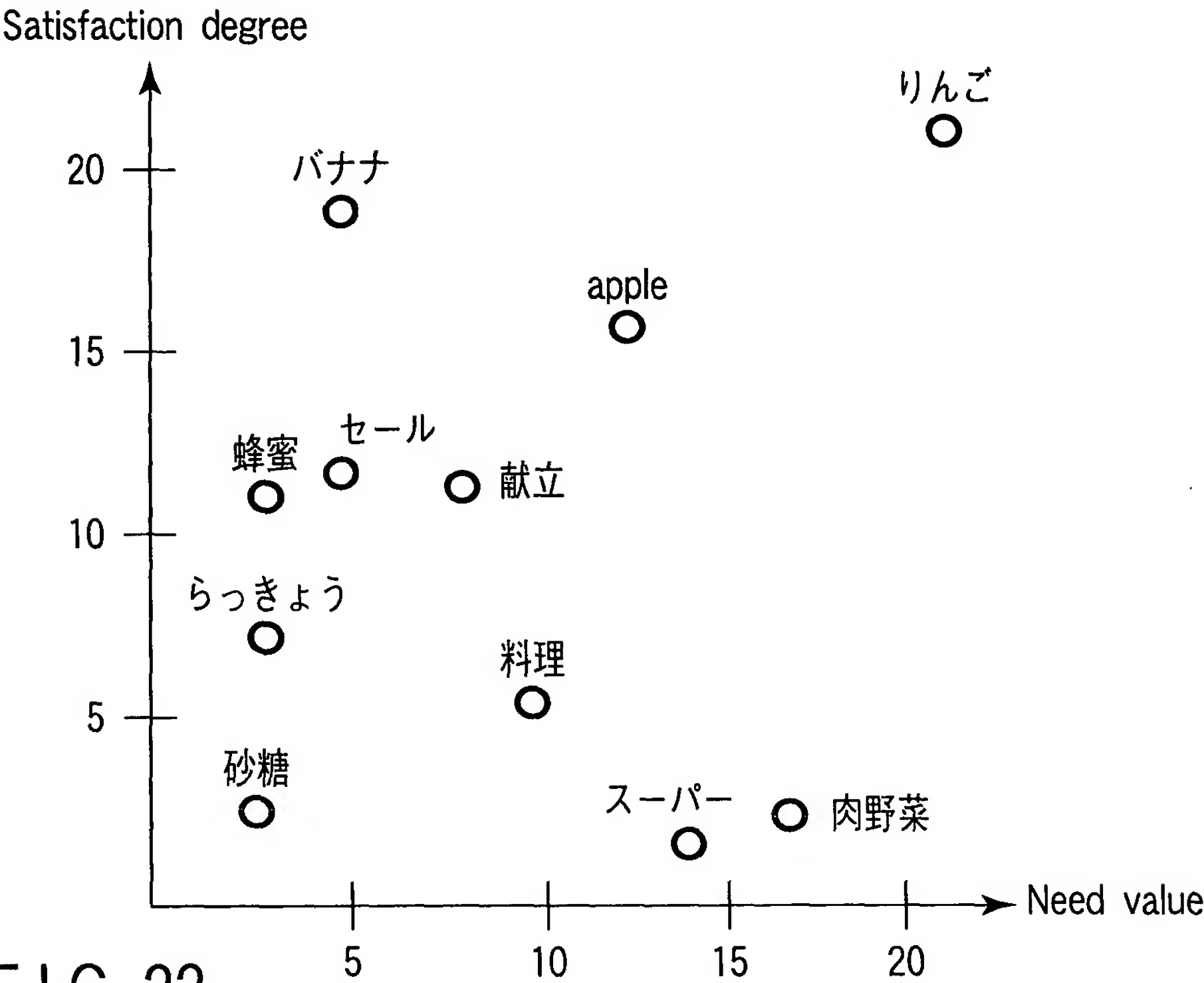


FIG. 22

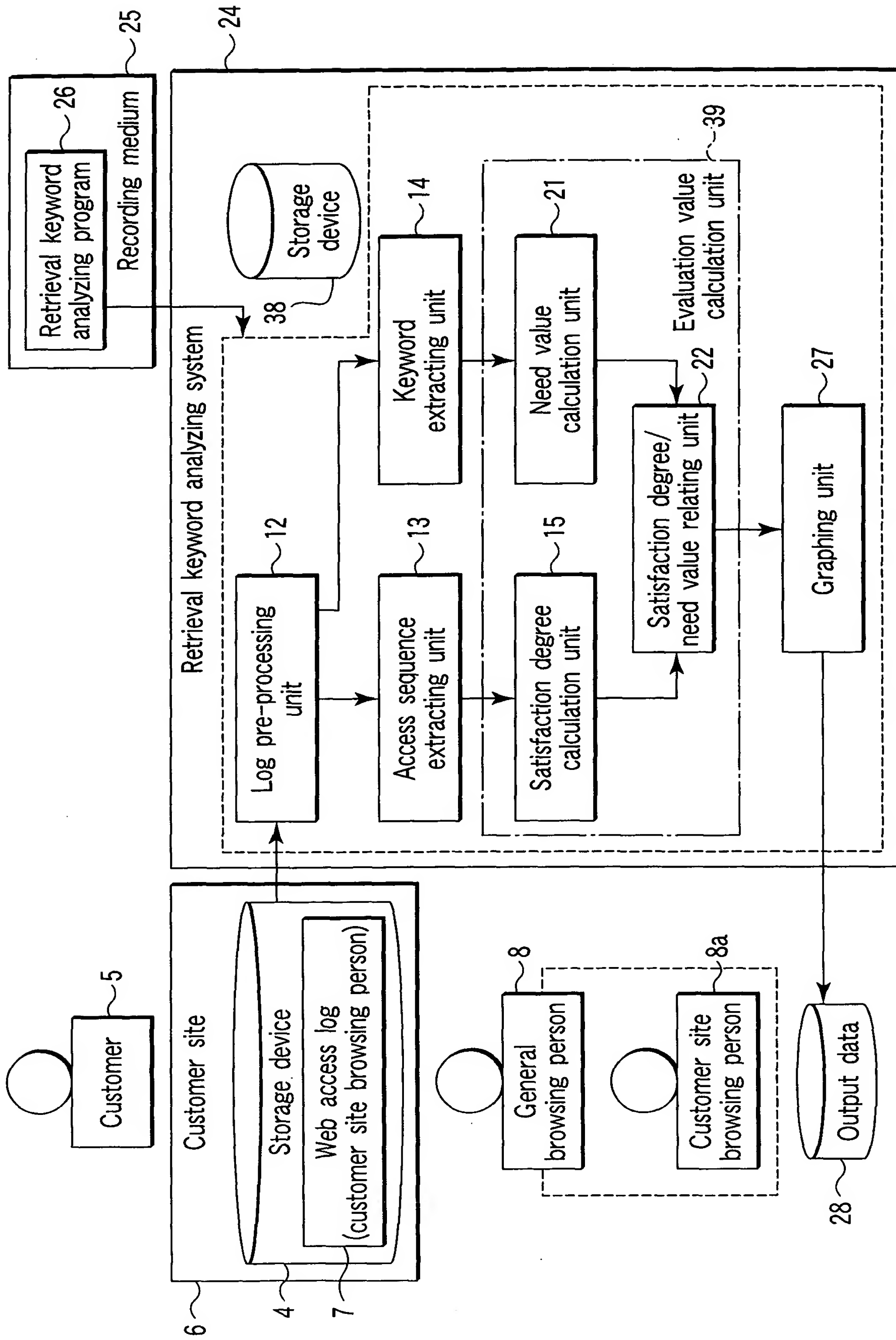


FIG. 21

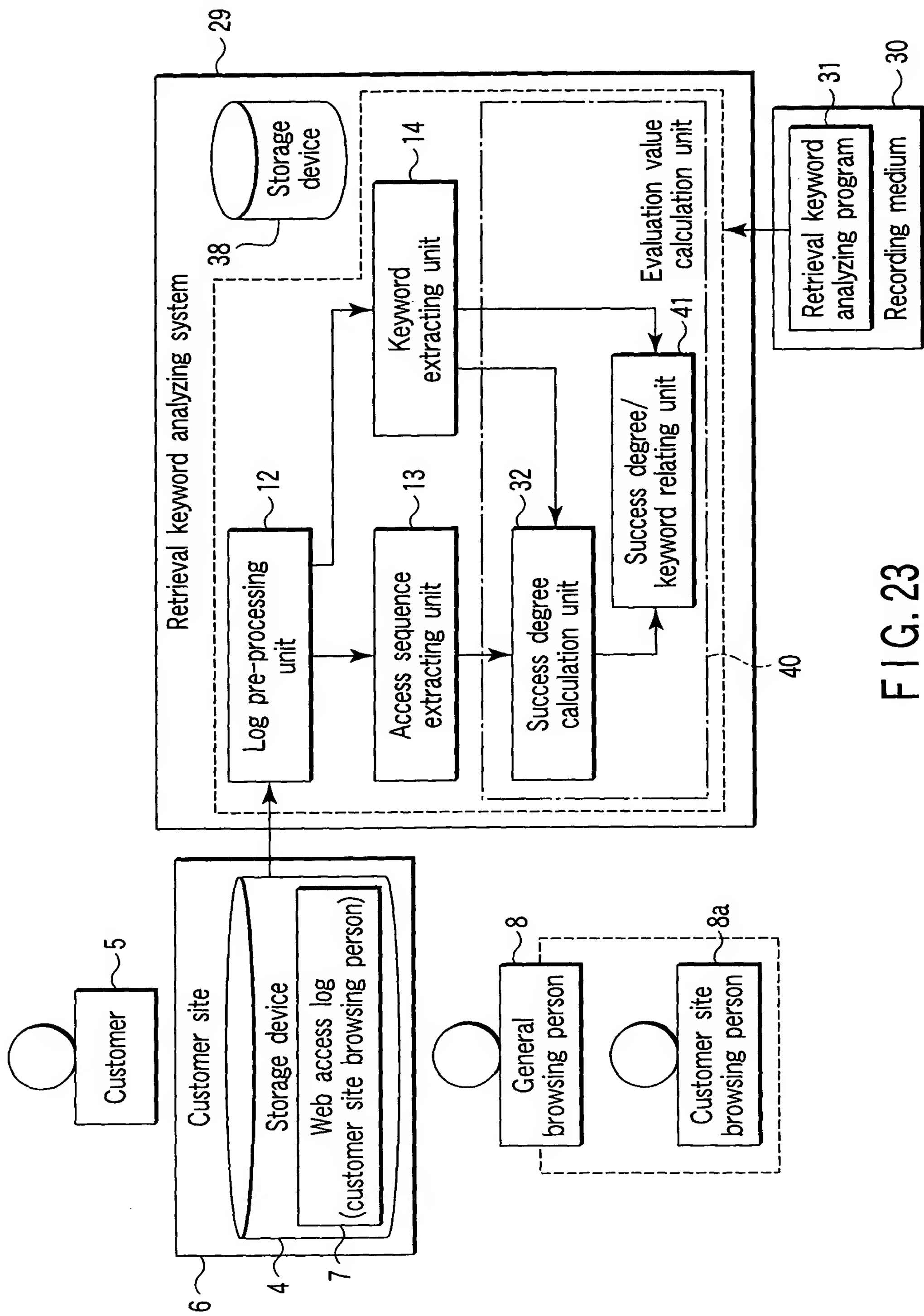


FIG. 23

Access demand page list

Retrieval keyword	Access demand page
りんご	/apple/index.html
apple	/apple/index.html
肉野菜	/meat/index.html
肉野菜	/vegetable/index.html
...	...
(Others)	

FIG. 24

Success degree weighting rule

Number of clicks from retrieval result page	Success degree
1	100
2	80
3	60
4	40
5 or more	20
No arrival	0

FIG. 25

Intermediate generation data (1)

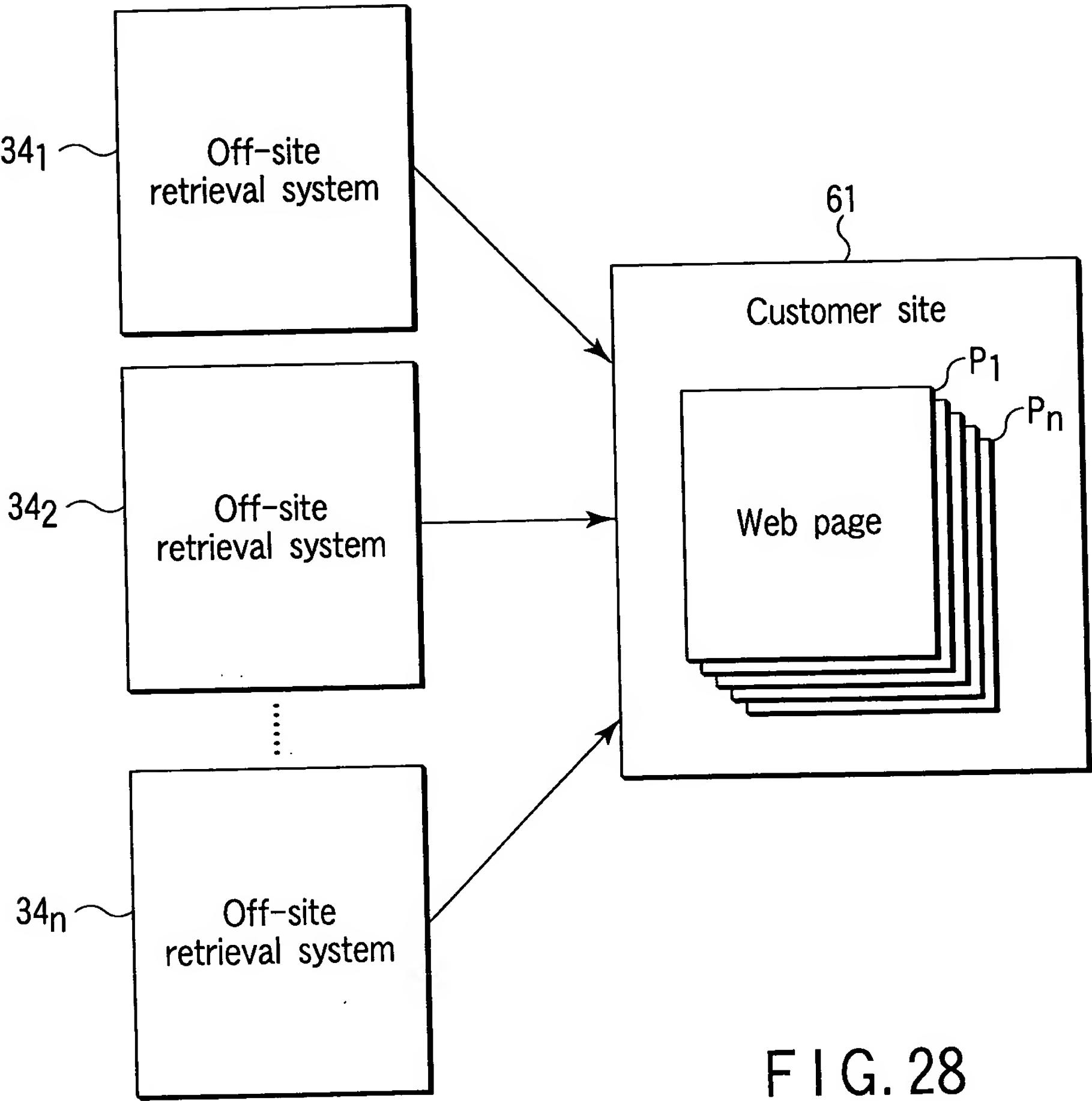
View ID	Visit ID	Request	Retrieval keyword
View 20	Visit 6	/index.html	
View 21	Visit 6	/search.cgi	
View 22	Visit 6	/search.cgi?q=%E3%82%8A%E3%82%93%E3%81%94	りんご
View 26	Visit 6	/general/index.html	
View 28	Visit 6	/apple/index.html	
View 37	Visit 6	/apple/tsugaru.html	
View 45	Visit 7	/index.html	
View 47	Visit 7	/search.cgi	
View 48	Visit 7	/search.cgi?q=apple	apple
...

FIG. 26

FIG. 27

Intermediate generation data (2)

Visit ID	Retrieval keyword	Success degree
Visit 6	りんご	80
Visit 7	apple	100
Visit 21	肉野菜	0
Visit 23	スーパー	60
Visit 30	りんご	20



Web access log with reference information

Host name	User ID	Date	Time	Request	End code	Number of transferred bytes	Reference information	User agent
pc001.○○○.co.jp	—	2002/2/14	18:56:14	/index.html	200	400	http://www.○○○.ne.jp/ □□□...	M○○illa/4.0 (compatible:M○IE...
ws20.△△△.co.jp	—	2002/2/14	18:57:30	/cgi/login.cgi	200	700	—	M○○illa/4.7 [△△5LLL](X11...
pc001.○○○.co.jp	—	2002/2/14	18:58:01	/products/index.html	200	2400	http://www.XXX.com/ △△△...	w△m/0.3+m□e- p21-26+m○e-1.5.2
pc001.○○○.co.jp	—	2002/2/14	18:58:40	products/info/p001.pdf	200	3000	http://www.○○○.ne.jp/ ○○○...	M○○illa/4.7 [△△5LLL](X11...
ws20.△△△.co.jp	—	2002/2/14	18:59:10	/cgi/order.cgi	200	700	http://www.○○○.ne.jp/ □□□...	M○○illa/4.0 (compatible:M○IE...

FIG. 29

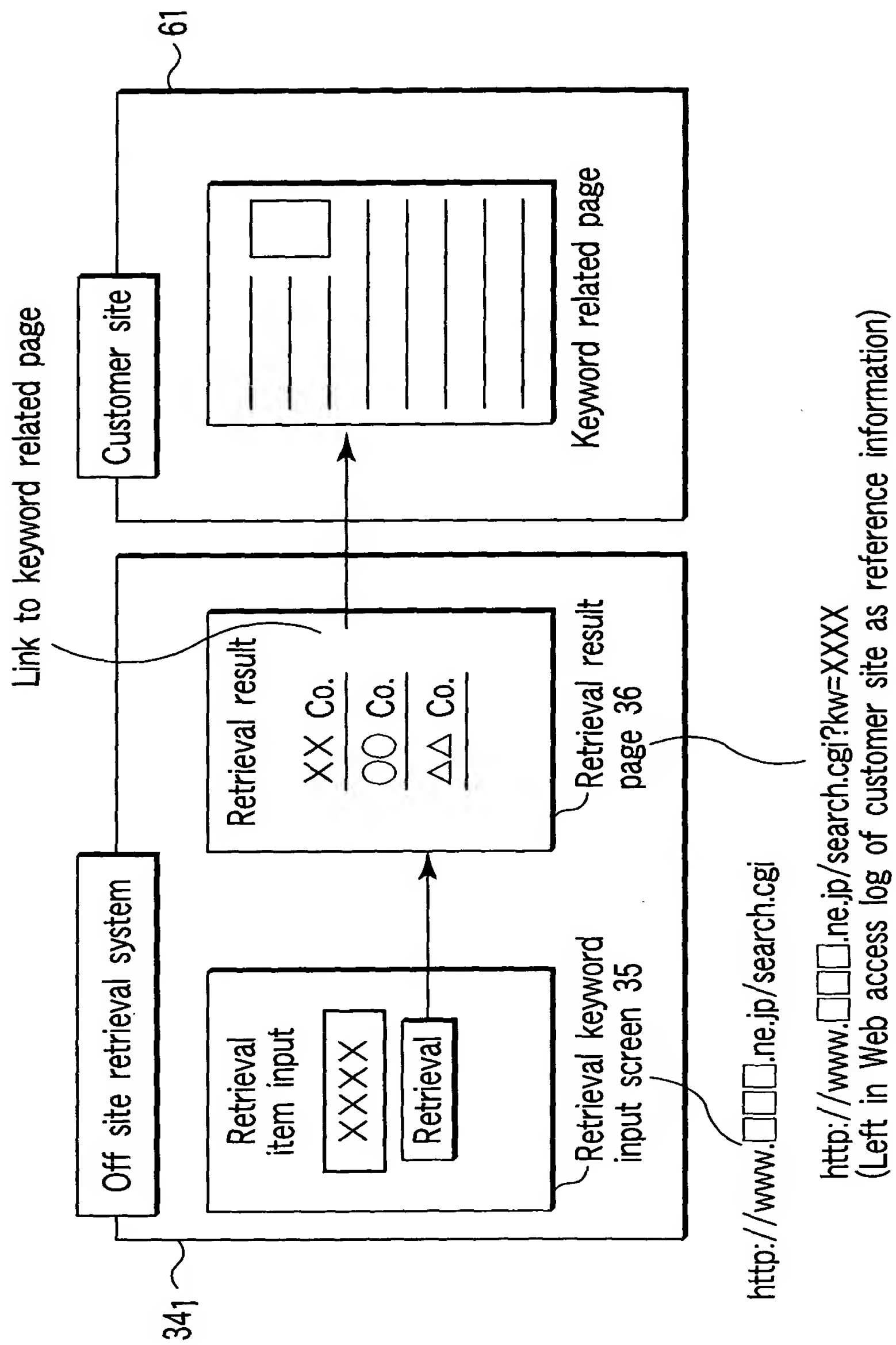


FIG. 30

Pattern

URL of retrieval system	Query pattern
http://www.△△△.com/	keyword
http://www.□□□.ne.jp/	kw
http://www.○○○.co.jp/	query
http://www.×××.co.jp/	word
http://www.◎◎◎.com/	q

FIG. 31

Access sequence data

View ID	Visit ID	Visitor ID	Date	Time	Request	Reference flag
View 1	Visit 1	Visitor 1	2002/2/14	18:56:14	/AAA.html	1
View 2	Visit 2	Visitor 2	2002/2/14	18:57:30	/BBB.cgi	0
View 3	Visit 1	Visitor 1	2002/2/14	18:58:01	/CCC.html	0
View 4	Visit 2	Visitor 2	2002/2/14	18:58:40	/GGG/DDD.cgi	0
View 5	Visit 3	Visitor 1	2002/2/14	19:42:10	/EEE.html	1

FIG. 32

Keyword data

View ID	Keyword contained in reference information
View 6	りんご
View 21	apple
View 43	banana
View 56	砂糖
View 81	カレー

FIG. 33

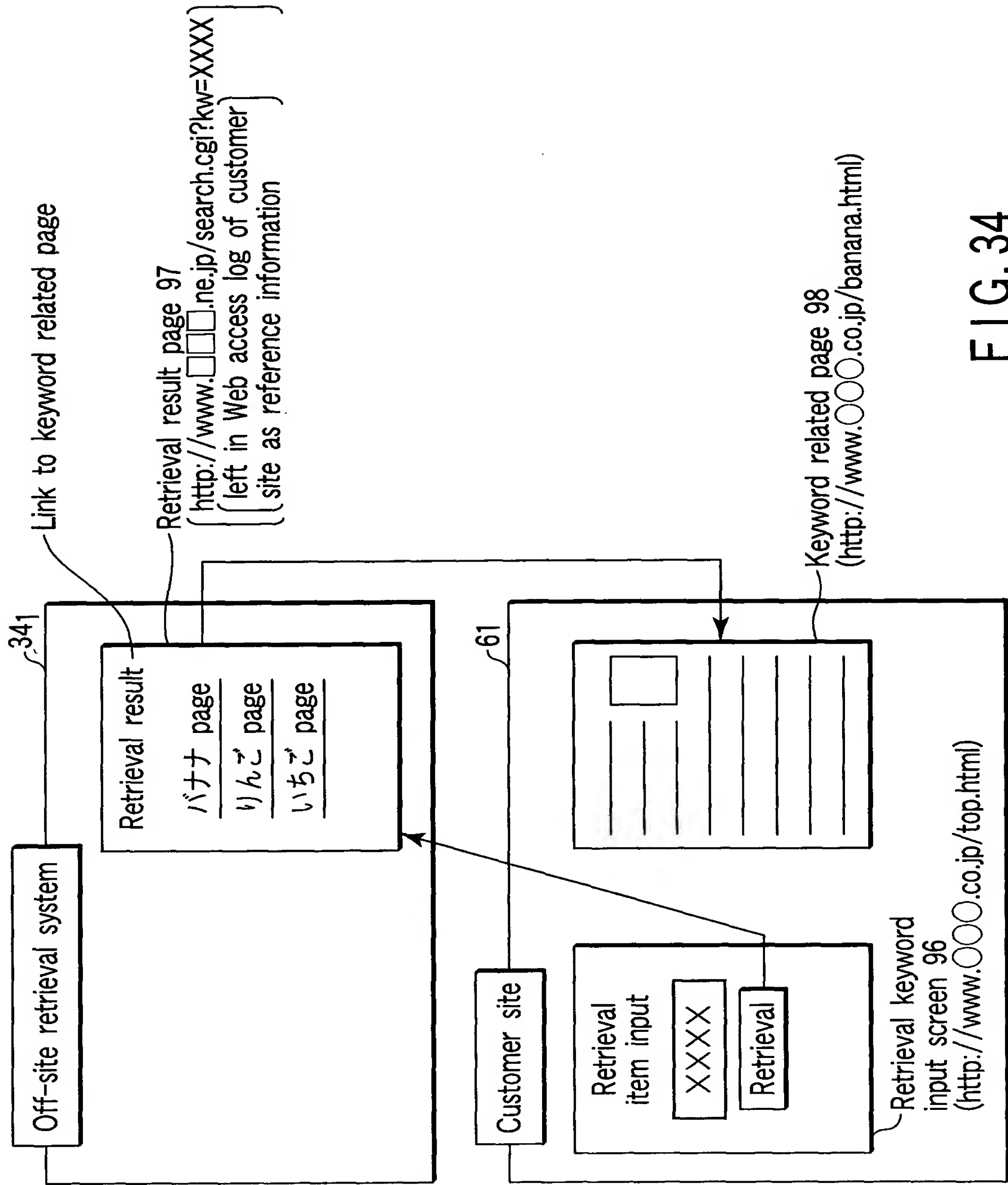


FIG. 34

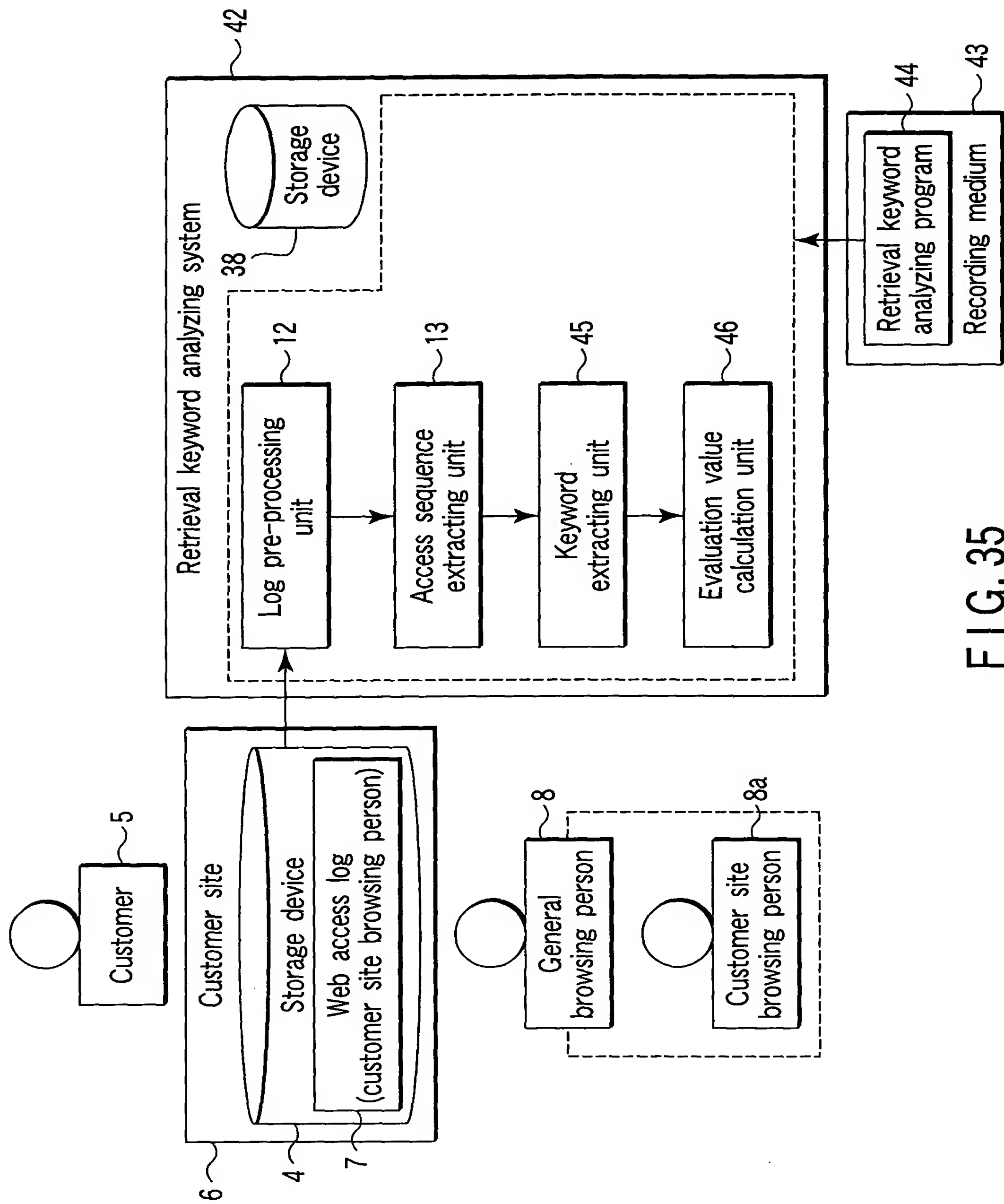


FIG. 35

Access sequence/keyword data

View ID	Visit ID	Visitor ID	Date	Time	Retrieval keyword
View 1	Visit 1	Visitor 1	2002/2/14	18:56:14	
View 2	Visit 2	Visitor 2	2002/2/14	18:57:30	りんご
View 3	Visit 1	Visitor 1	2002/2/14	18:58:01	
View 4	Visit 2	Visitor 2	2002/2/14	18:58:40	
View 5	Visit 3	Visitor 1	2002/2/14	19:42:10	たまねぎ

FIG. 36

Intermediate generation data

View ID	Visit ID	Satisfaction degree data	Retrieval keyword
View 1	Visit 1	0	
View 2	Visit 2	20	りんご
View 3	Visit 1	0	
View 4	Visit 2	20	
View 5	Visit 3	10	たまねぎ

FIG. 37

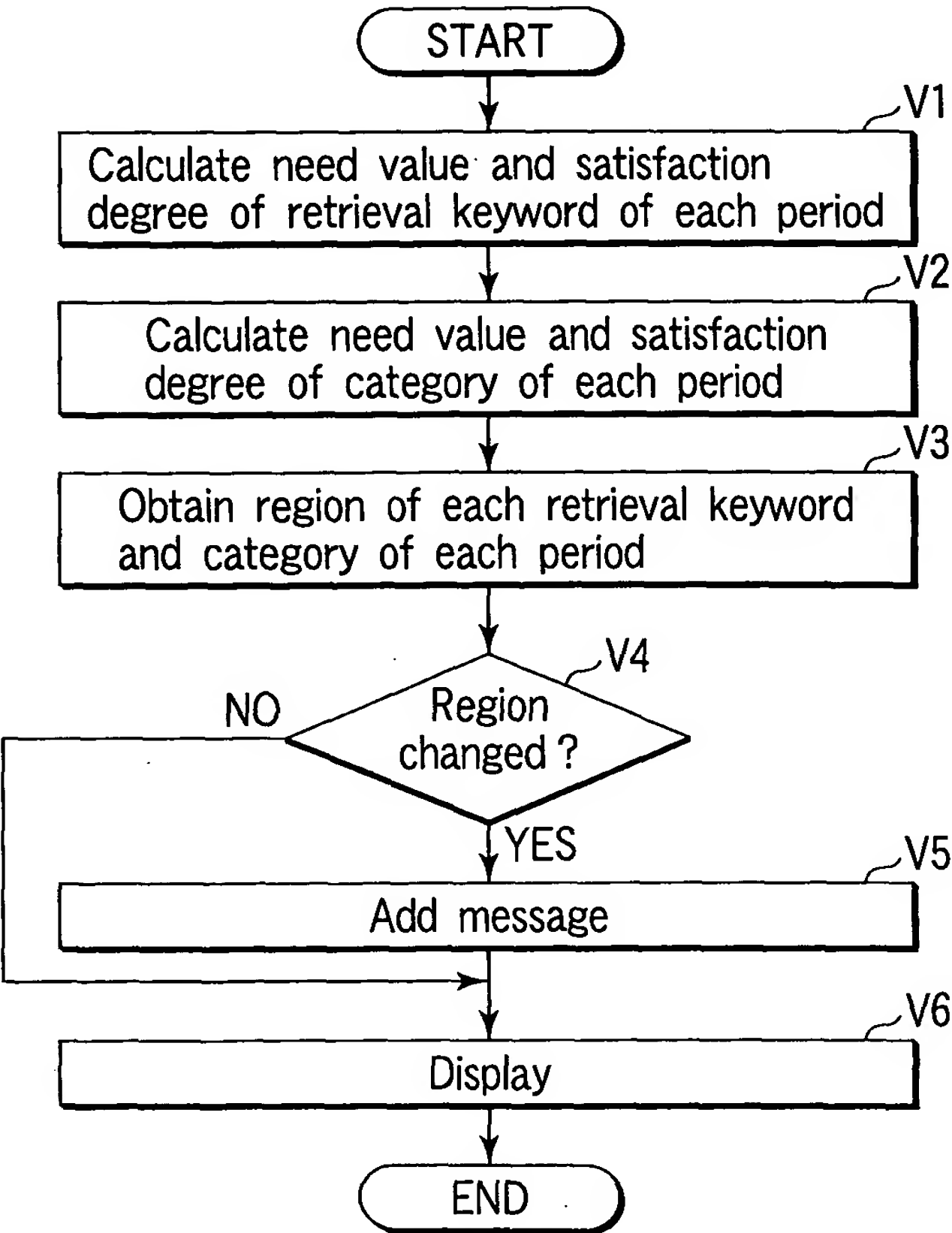


FIG. 39

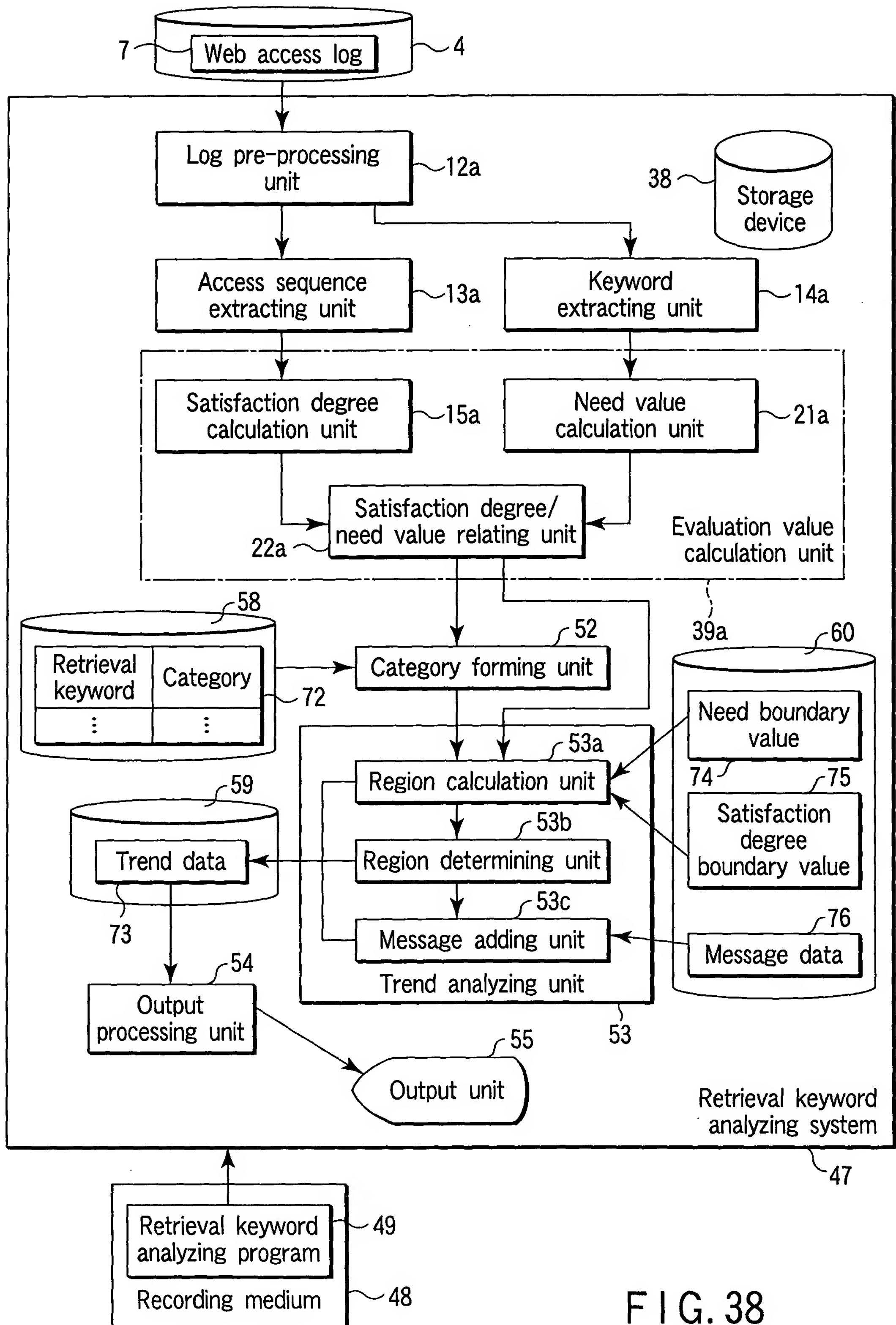


FIG. 38

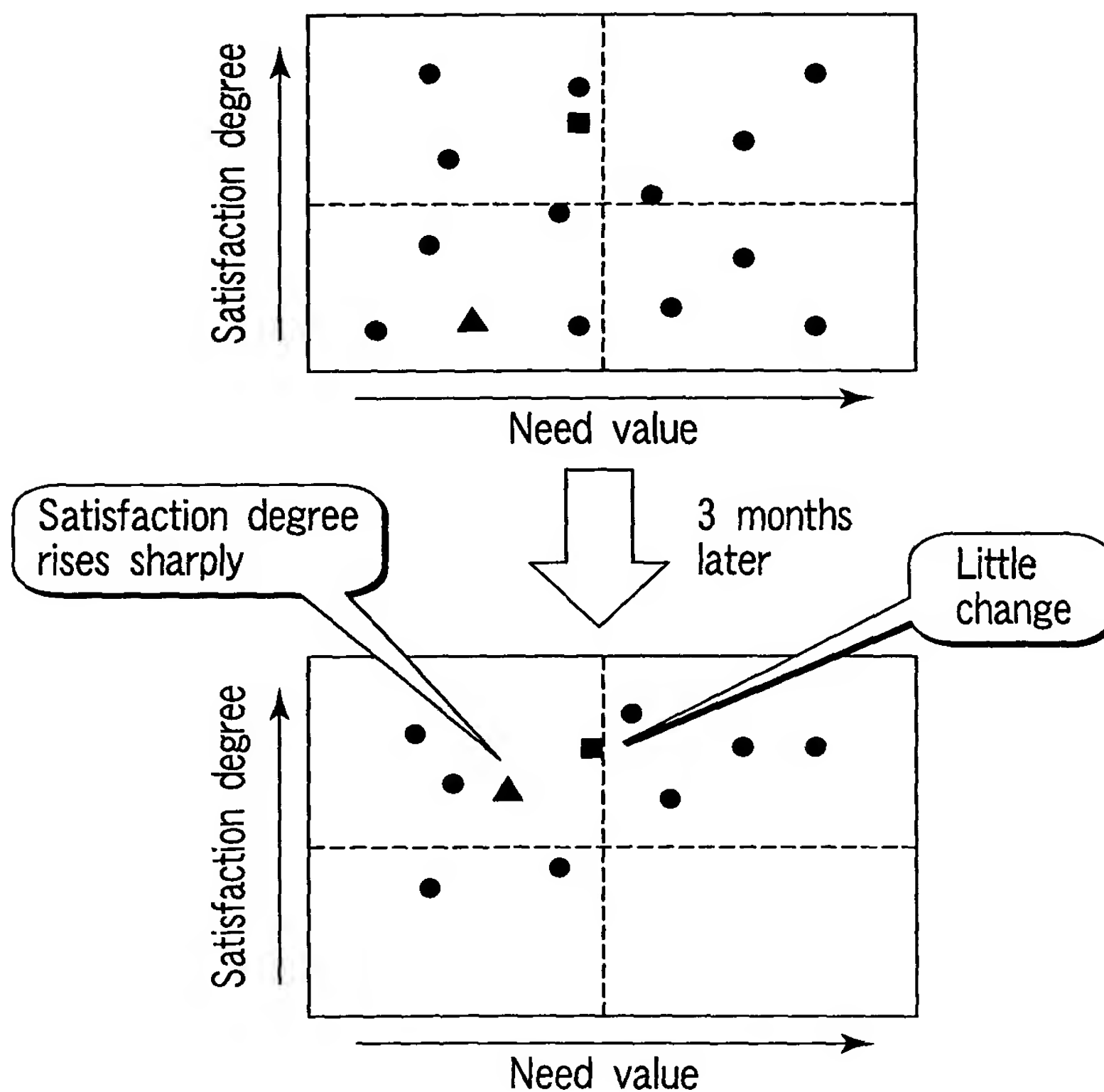
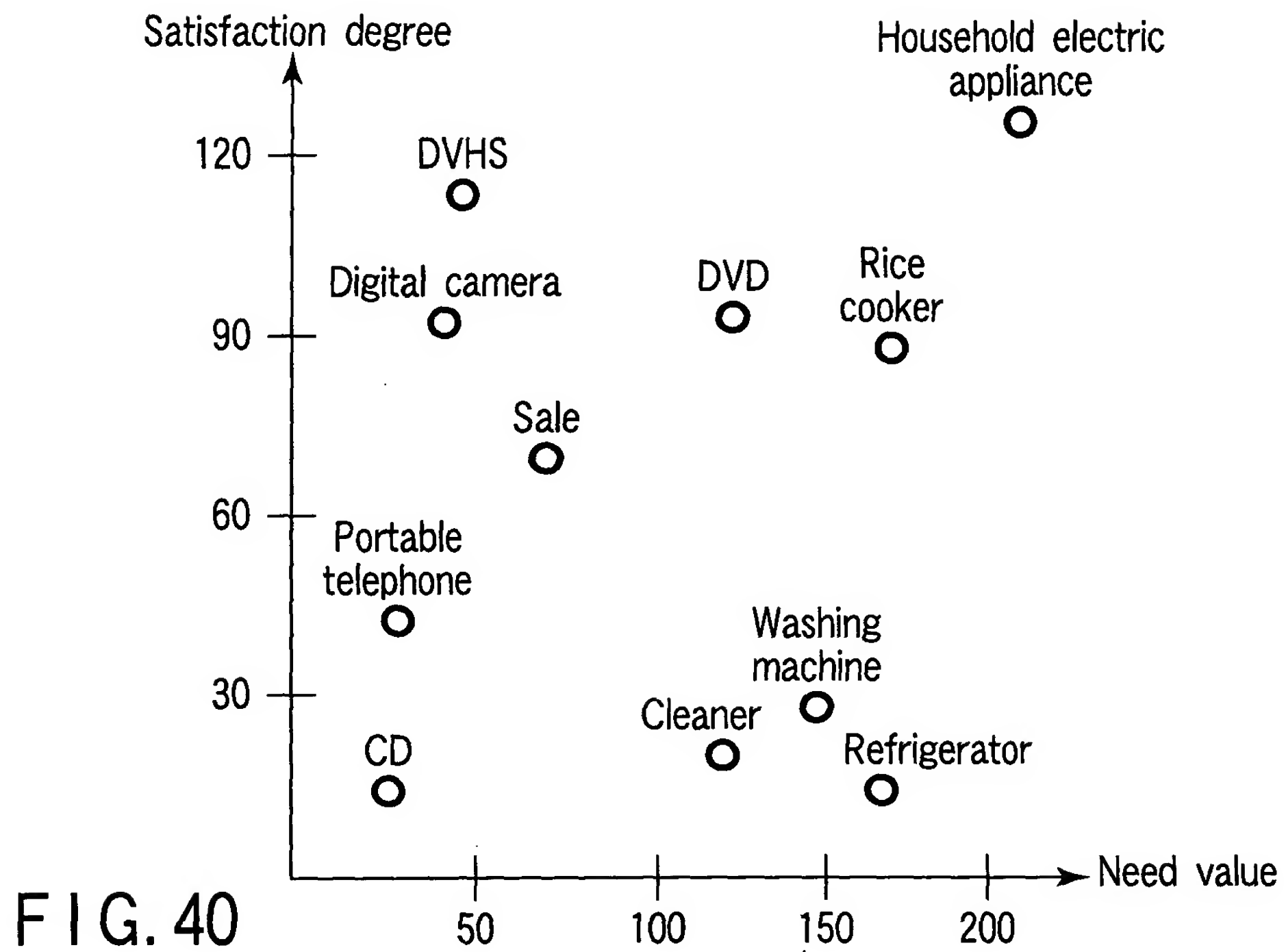


FIG. 42
(Trend of each retrieval keyword)

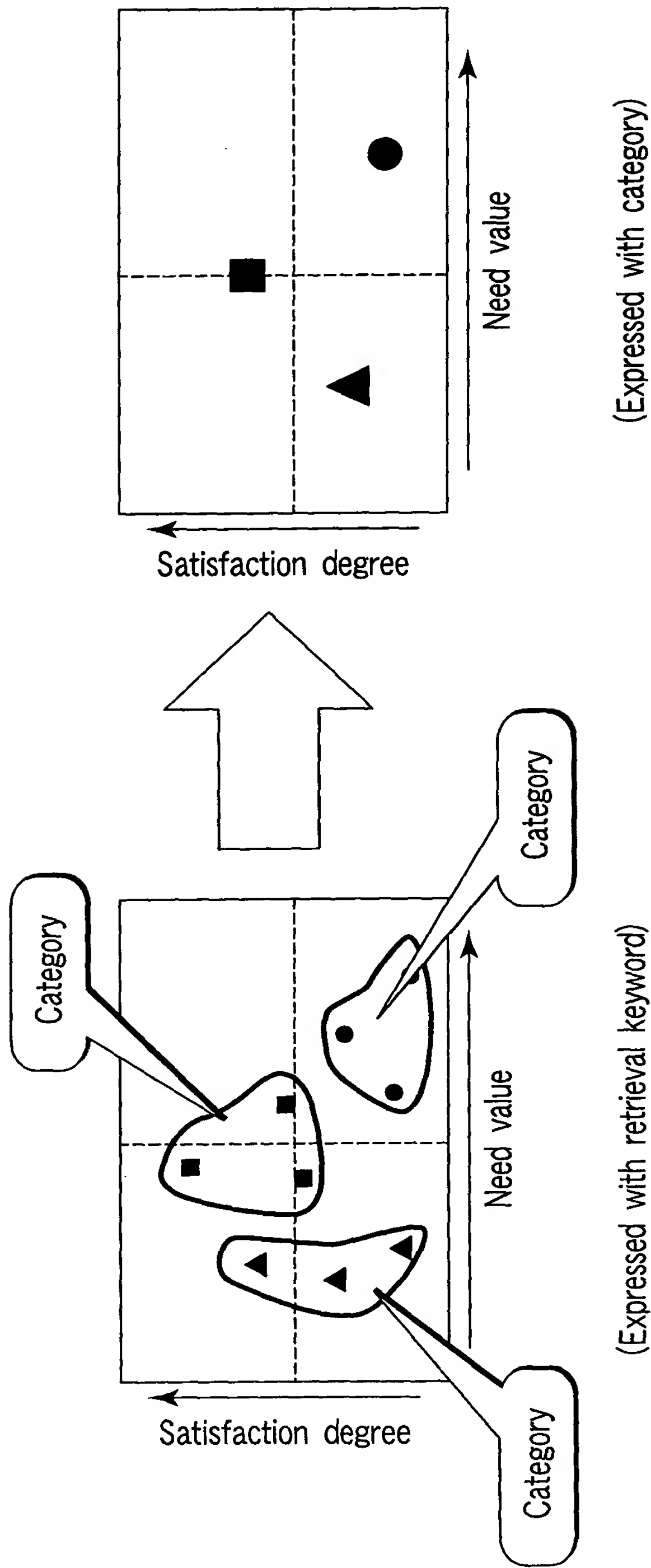


FIG. 41

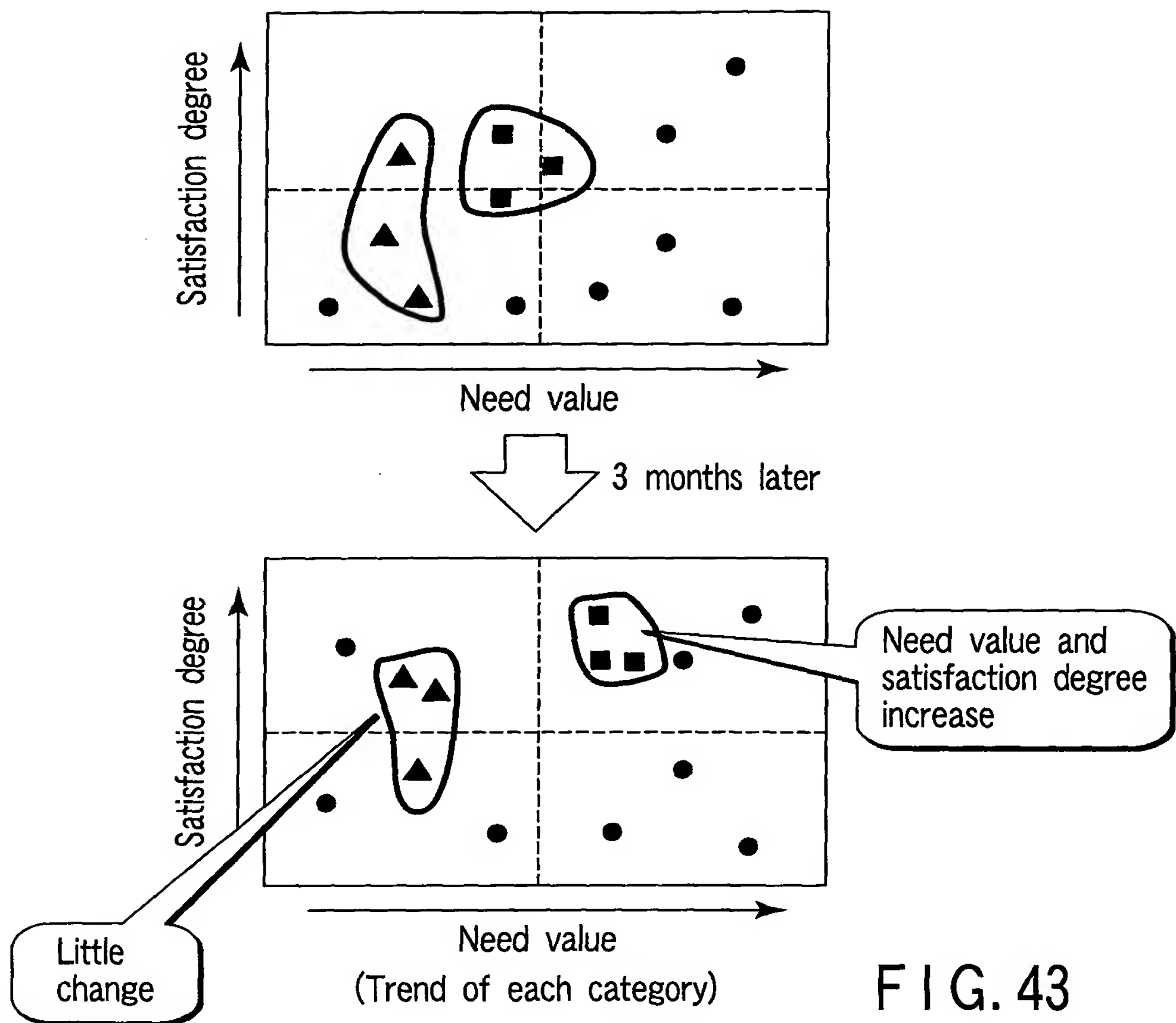


FIG. 43

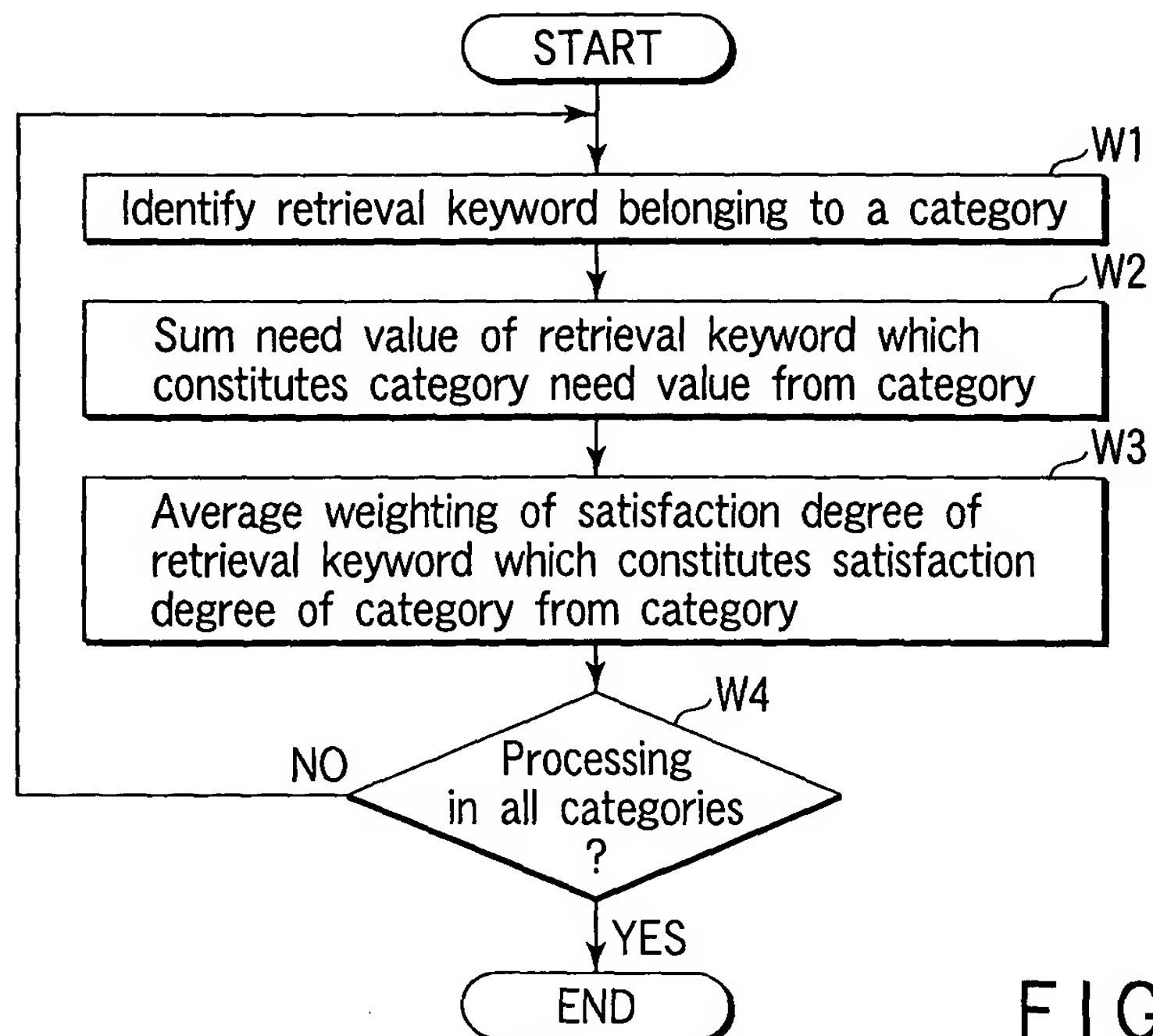


FIG. 44

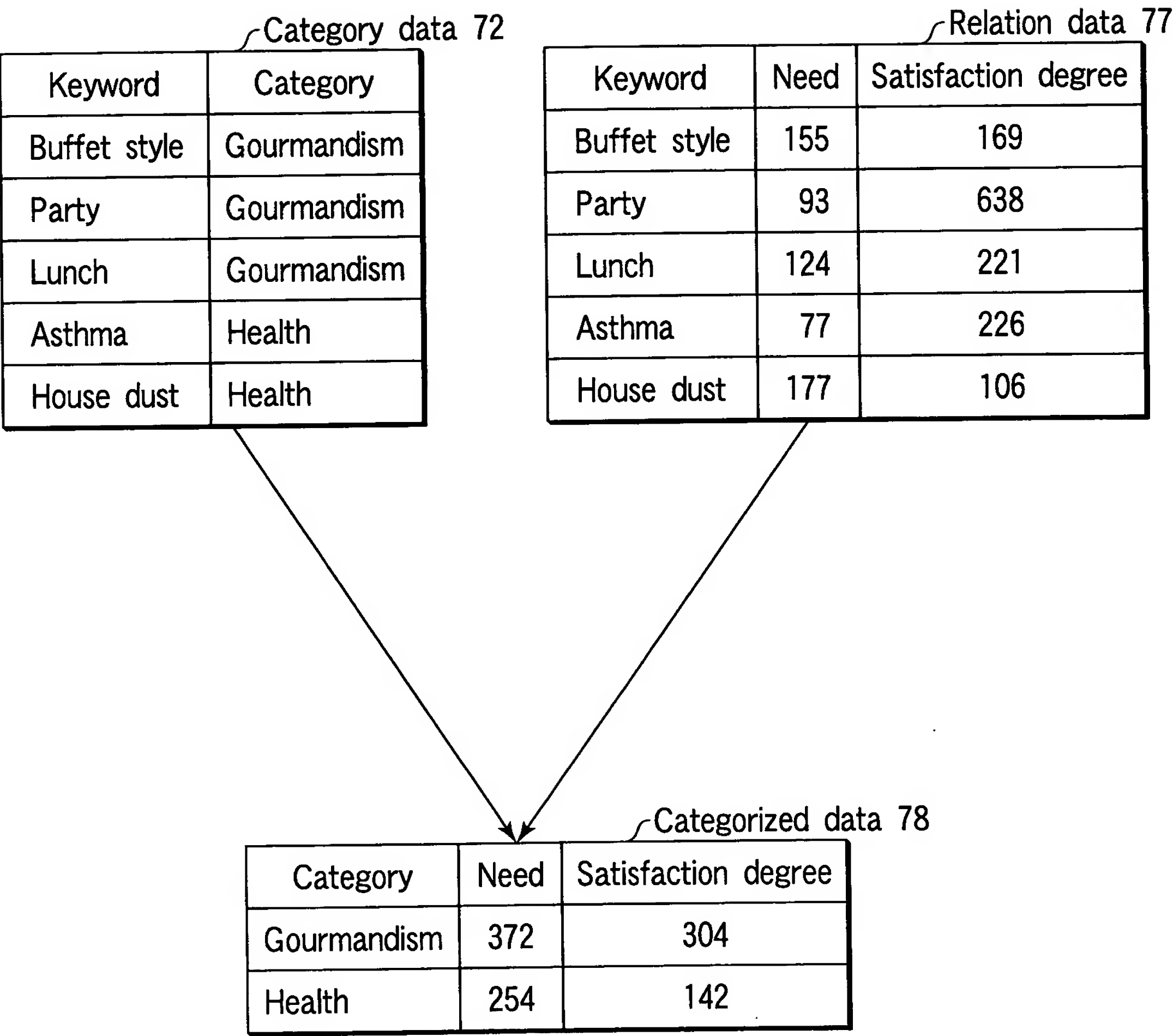


FIG. 45

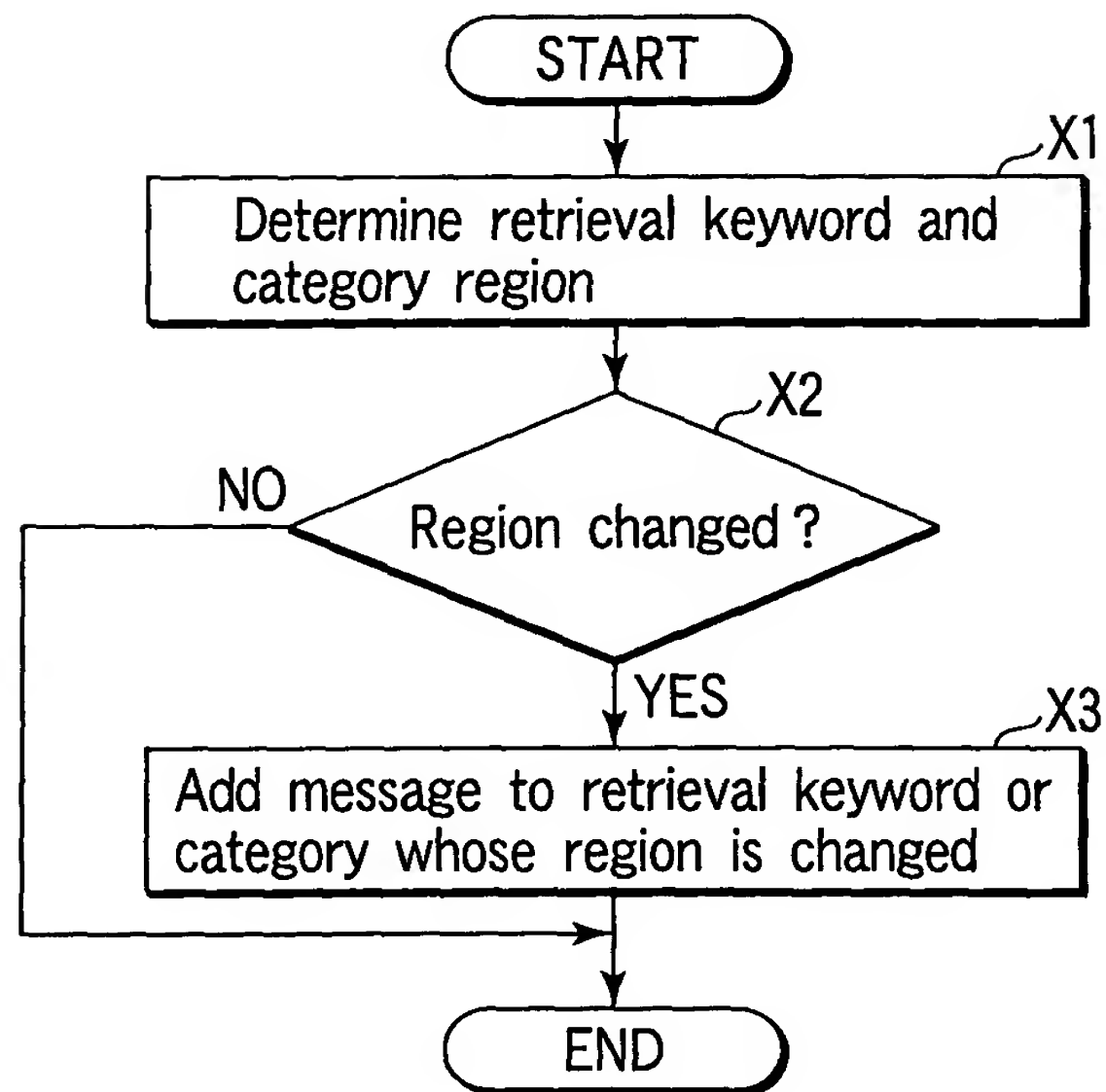


FIG. 46

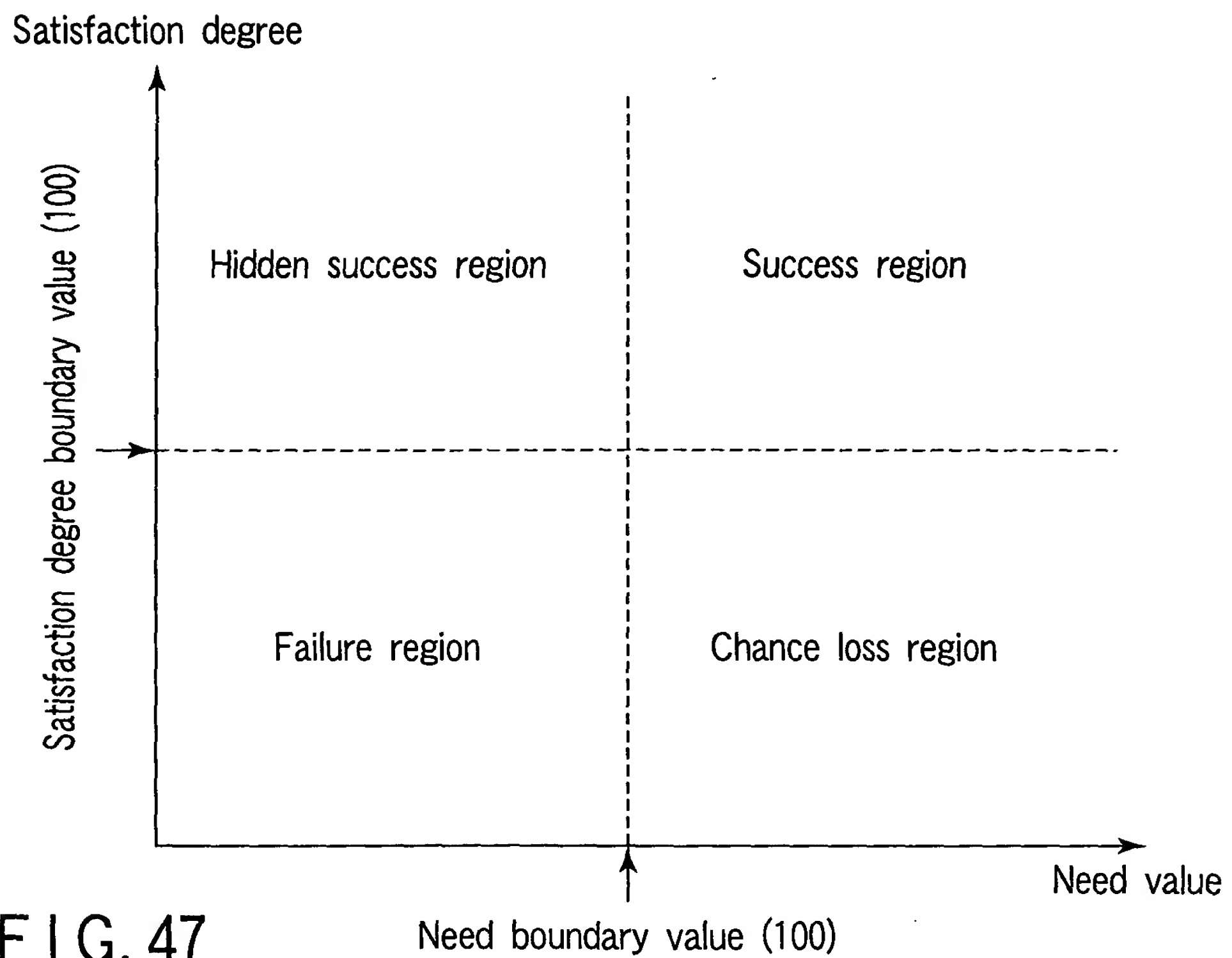


FIG. 47

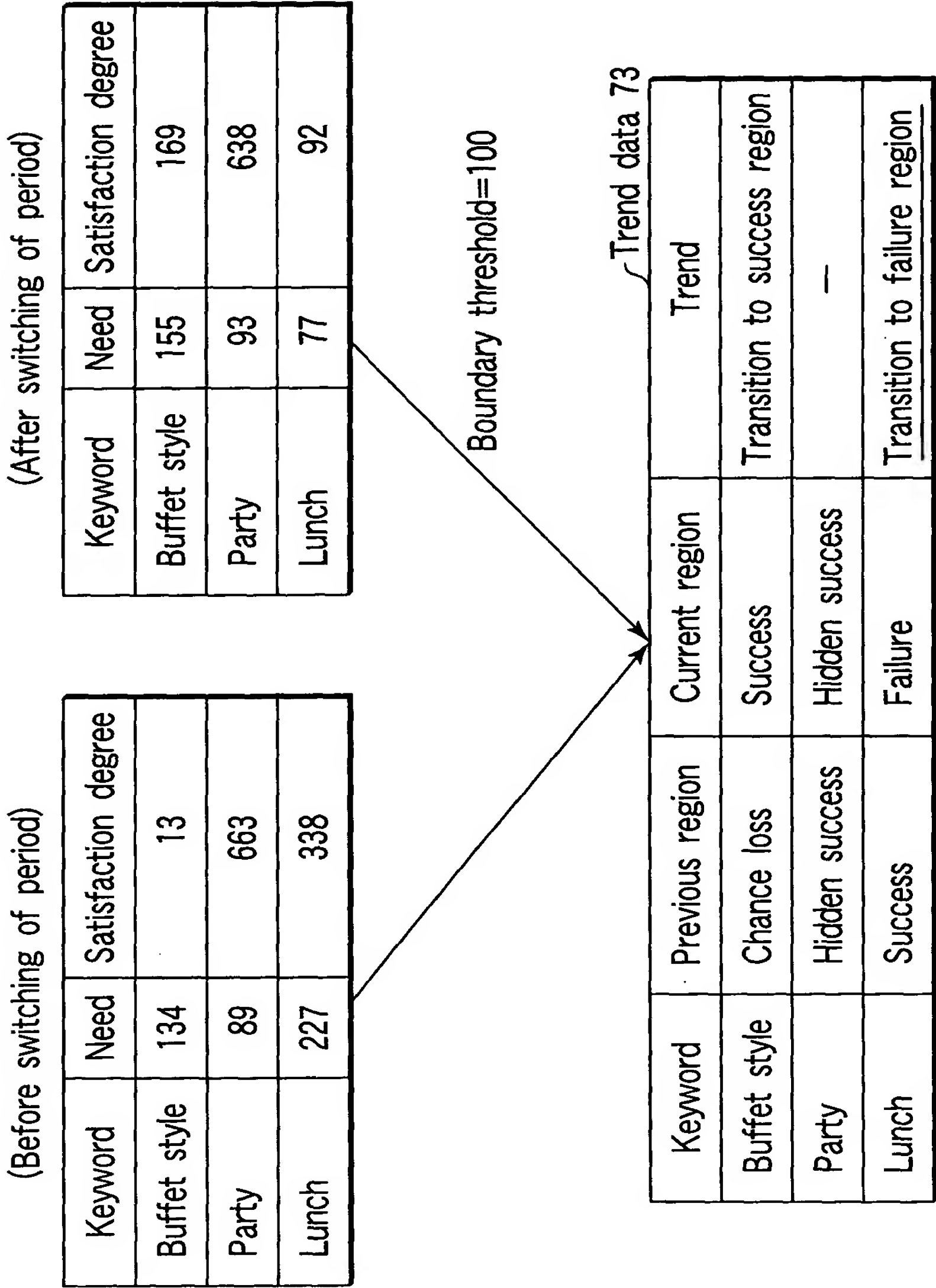
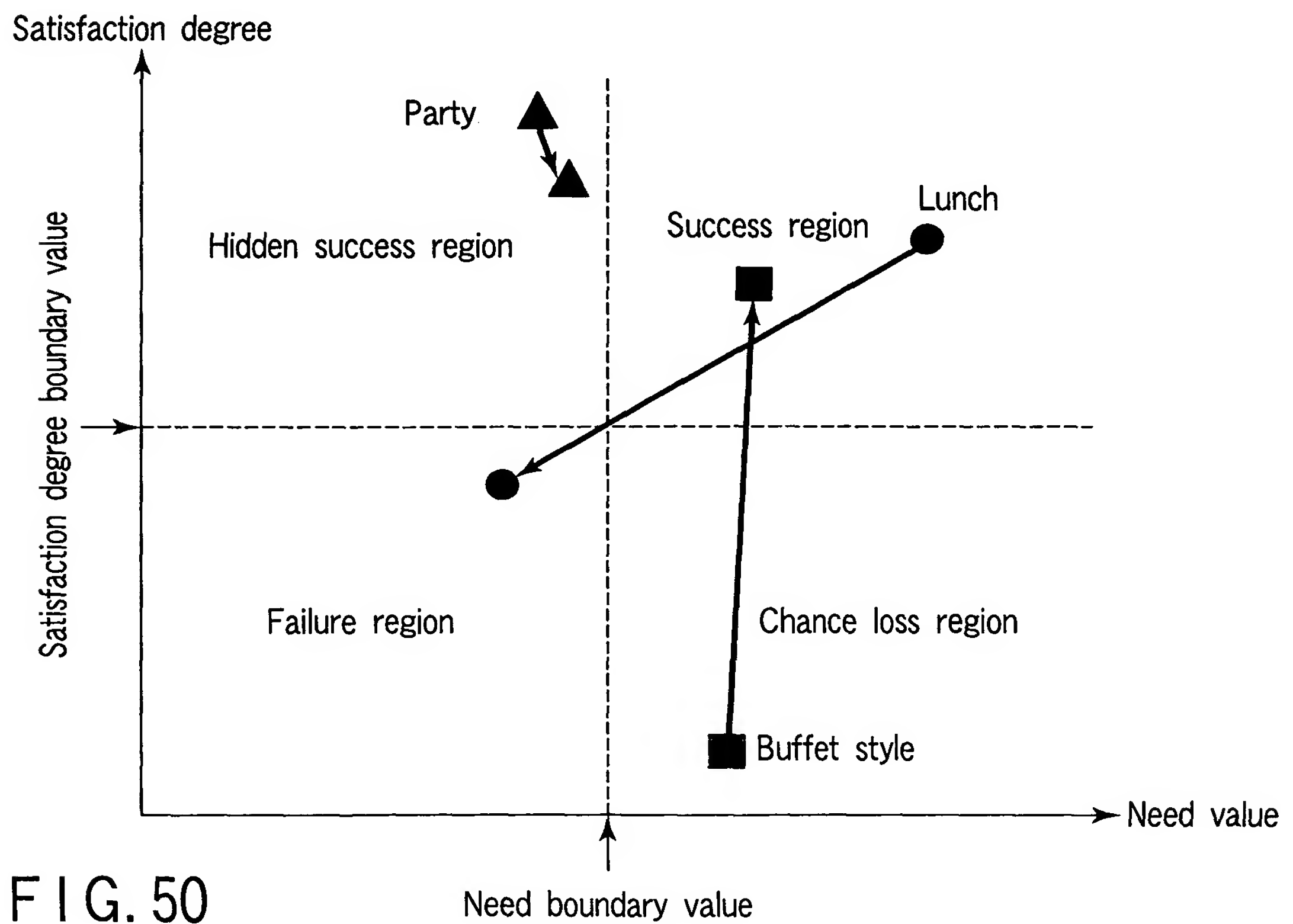
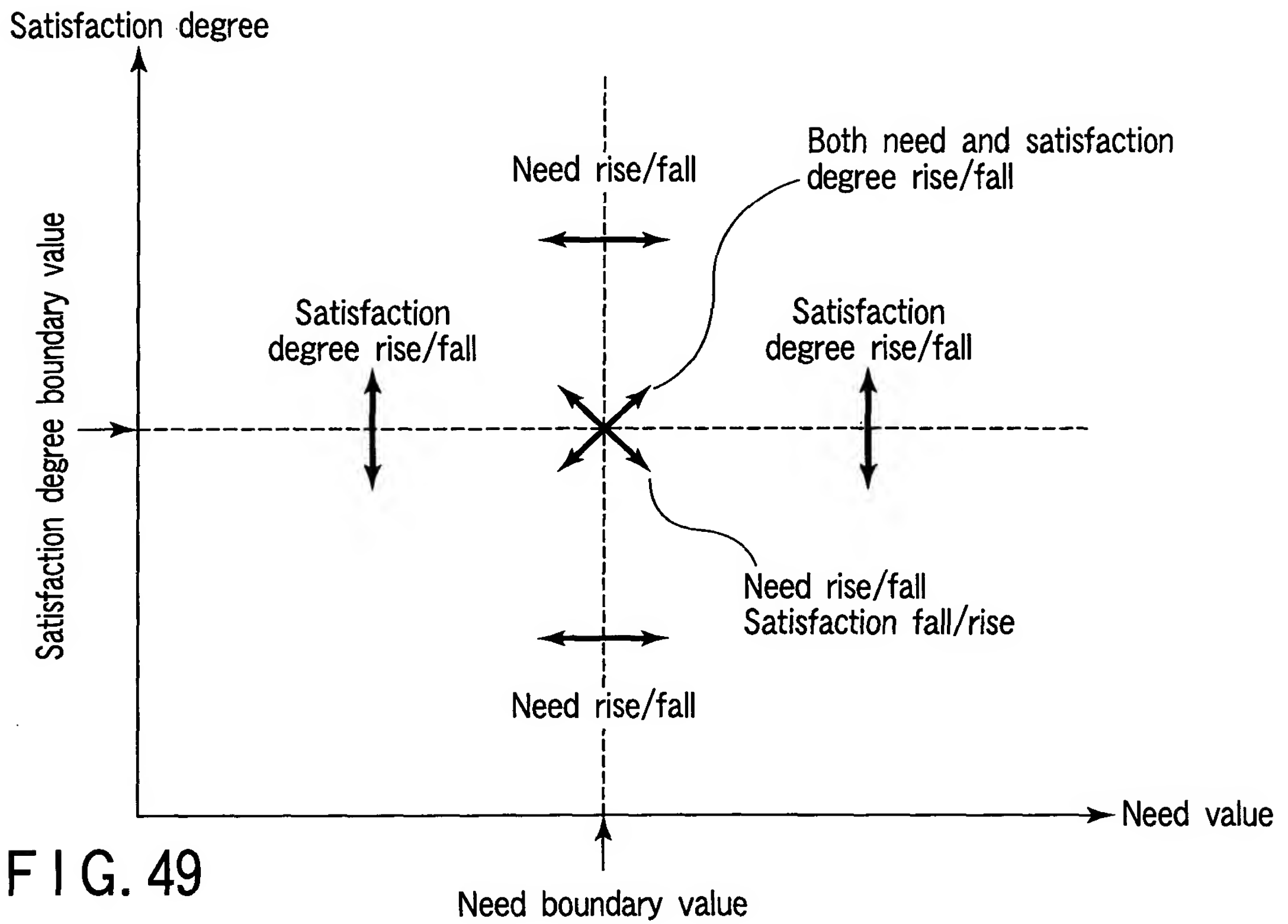


FIG. 48



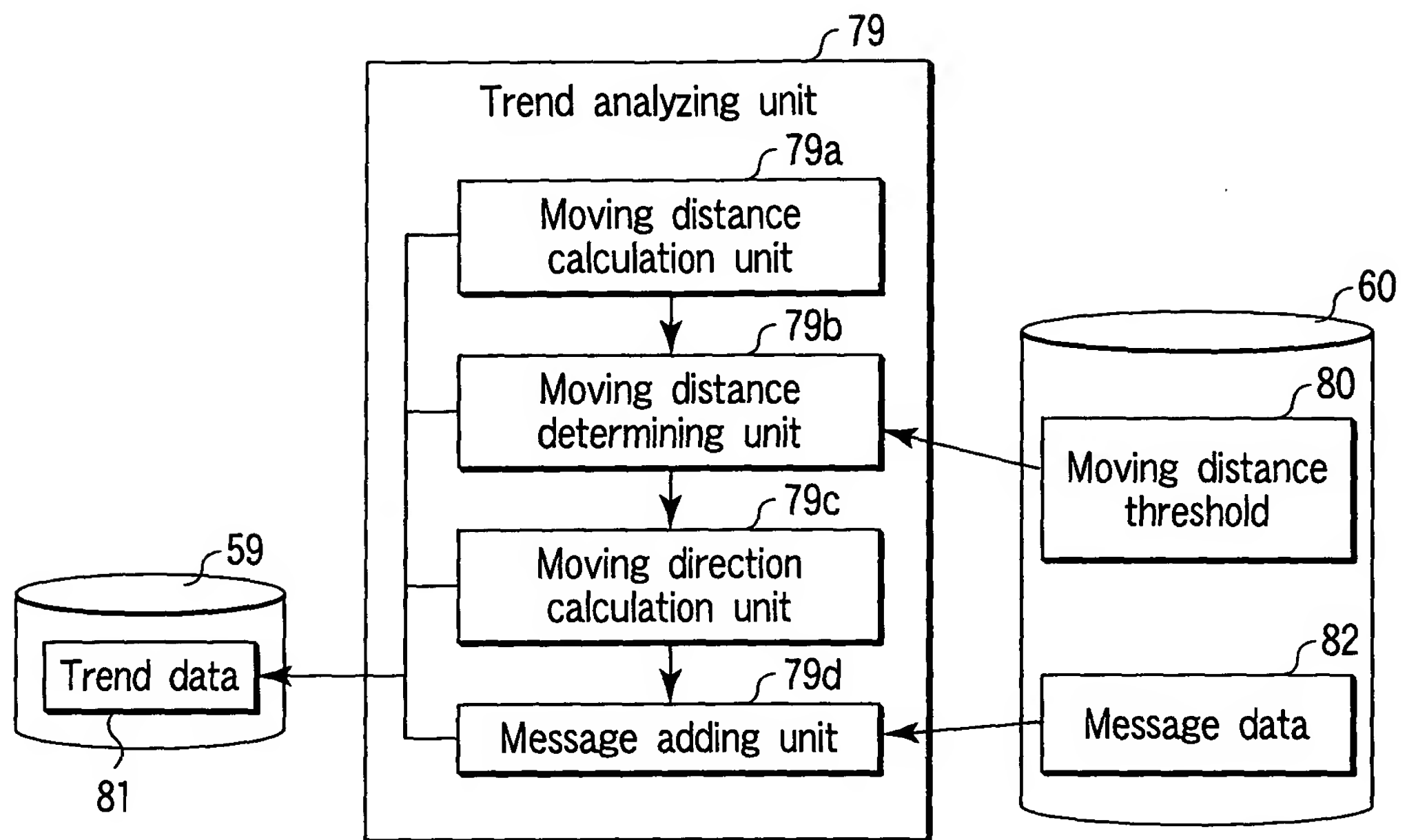


FIG. 51

(In case where moving distance threshold is 120)

Moving distance D	Action
$D < 120$	—
$120 \leq D$	Calculate moving direction, adding of message

FIG. 52

Moving direction θ	Message to be added
$0^\circ \leq \theta < 30^\circ$	Need rises
$30^\circ \leq \theta < 60^\circ$	Need/satisfaction degree rise
$60^\circ \leq \theta < 120^\circ$	Satisfaction degree rises
$120^\circ \leq \theta < 150^\circ$	Need falls while satisfaction degree rises
$150^\circ \leq \theta < 210^\circ$	Need falls
$210^\circ \leq \theta < 240^\circ$	Both need and satisfaction degree fall
$240^\circ \leq \theta < 300^\circ$	Satisfaction degree falls
$300^\circ \leq \theta < 330^\circ$	Need rise while satisfaction degree falls
$330^\circ \leq \theta < 360^\circ$	Need rises

FIG. 53

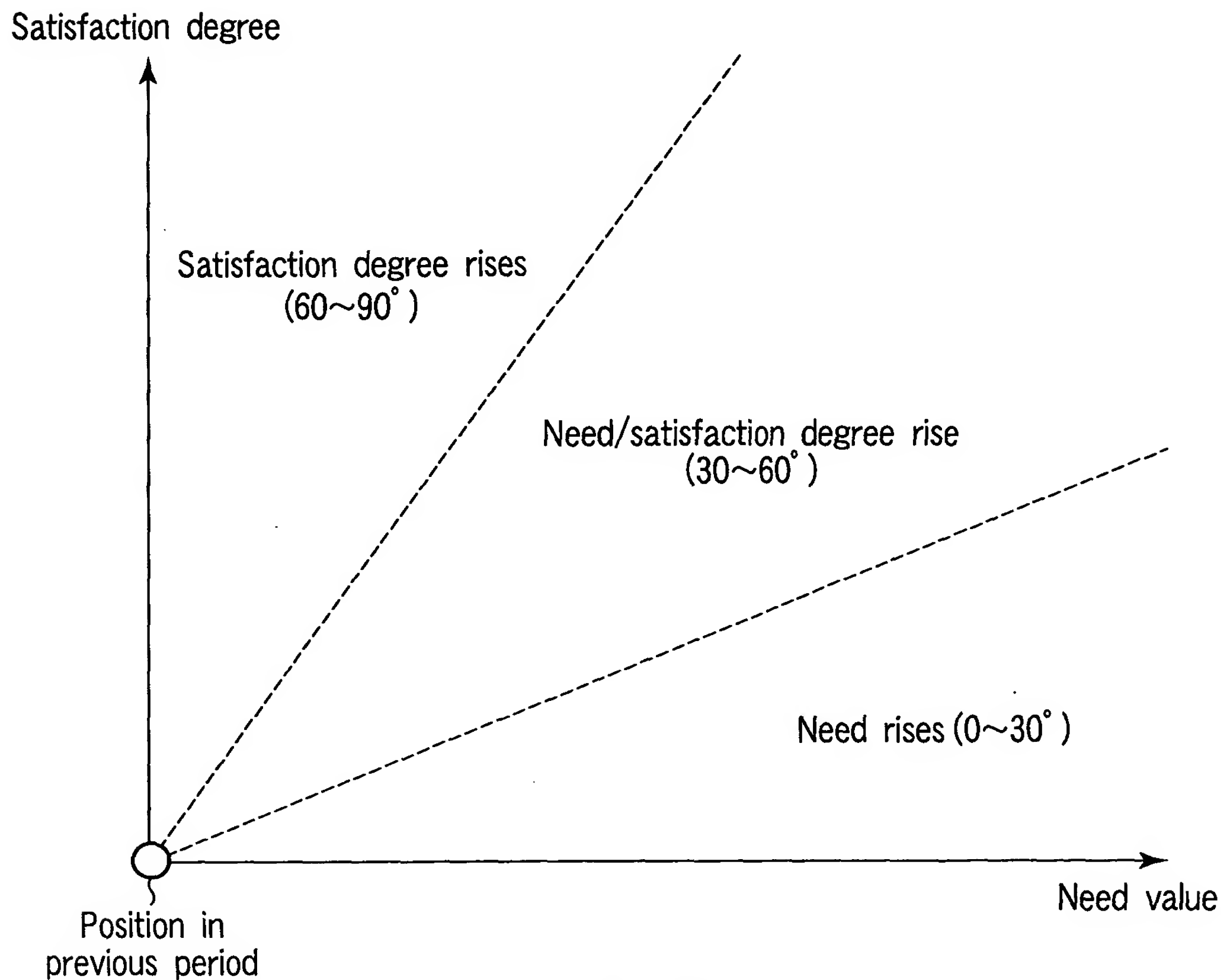


FIG. 54

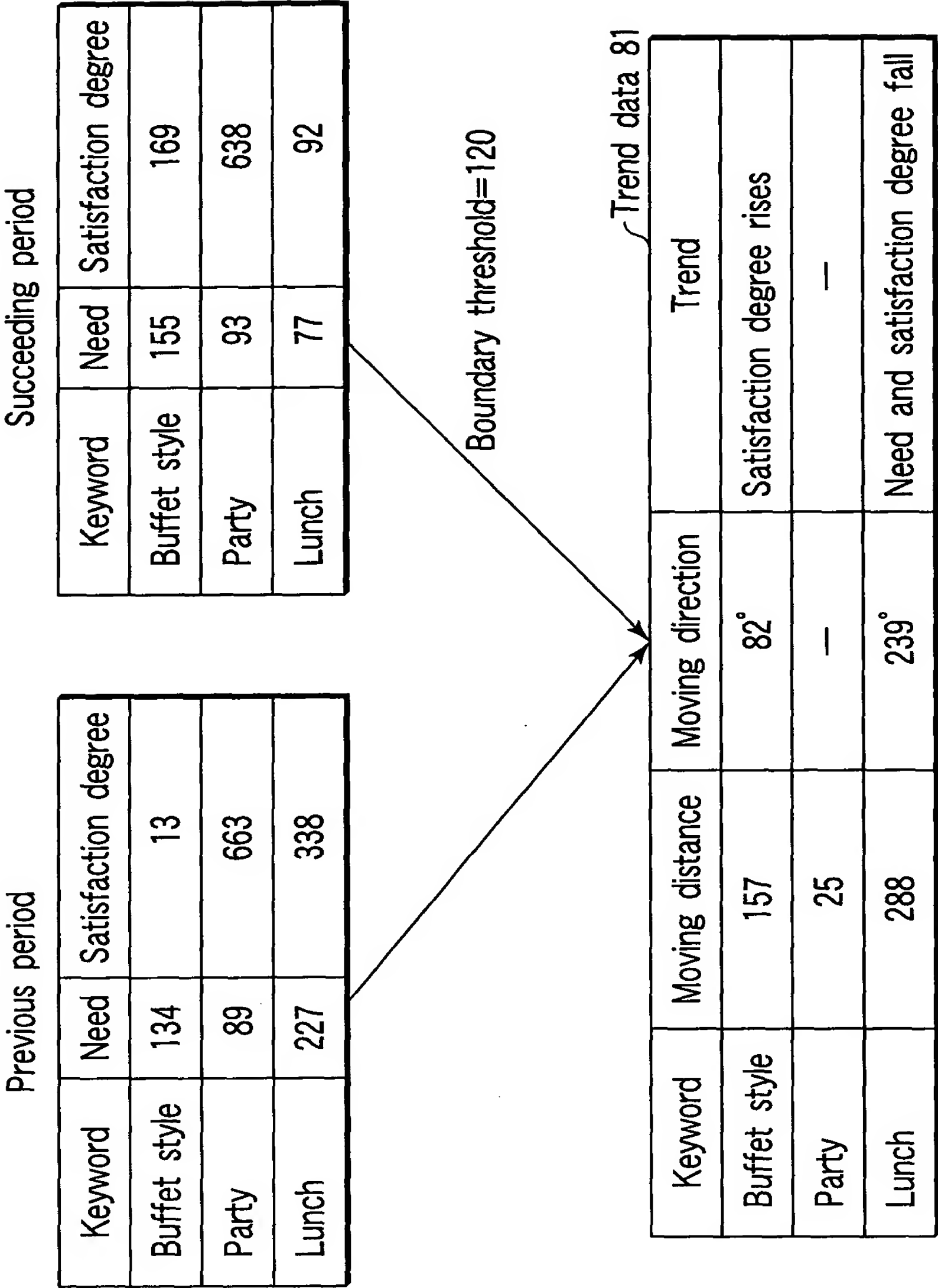


FIG. 55

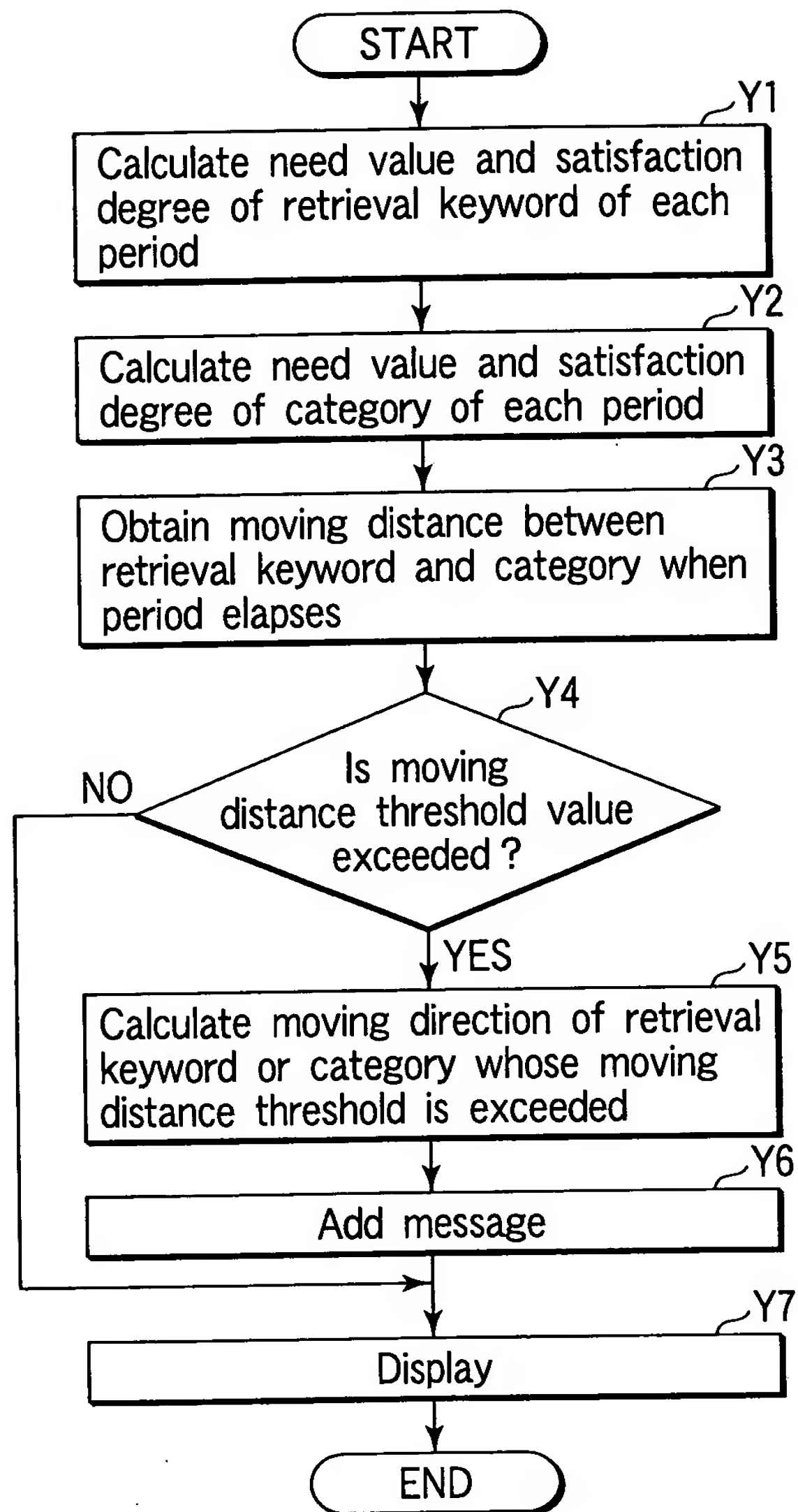


FIG. 56

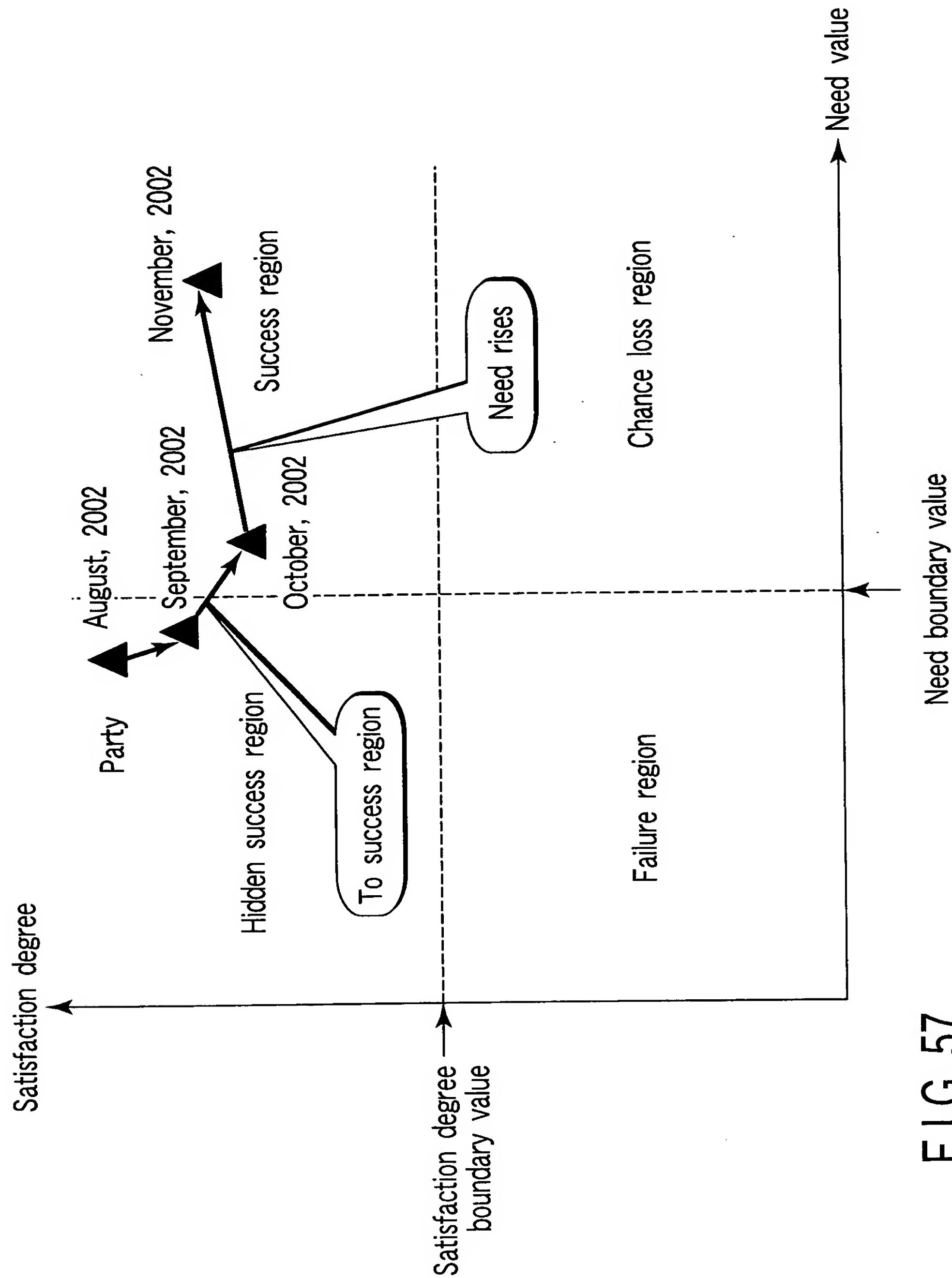


FIG. 57

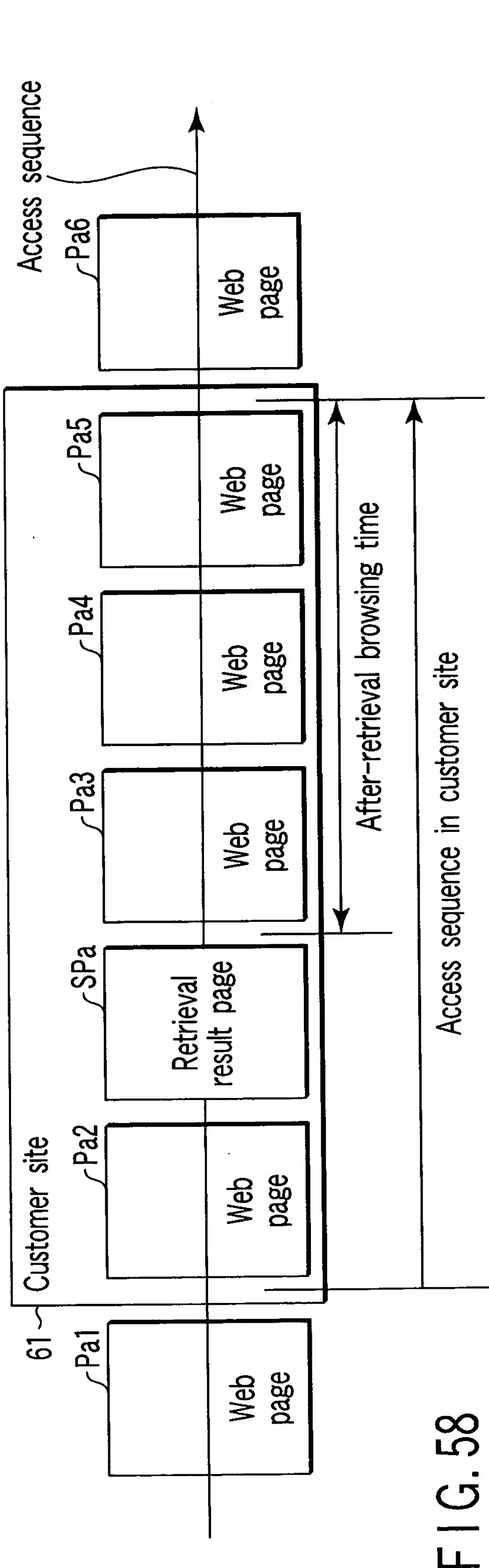


FIG. 58

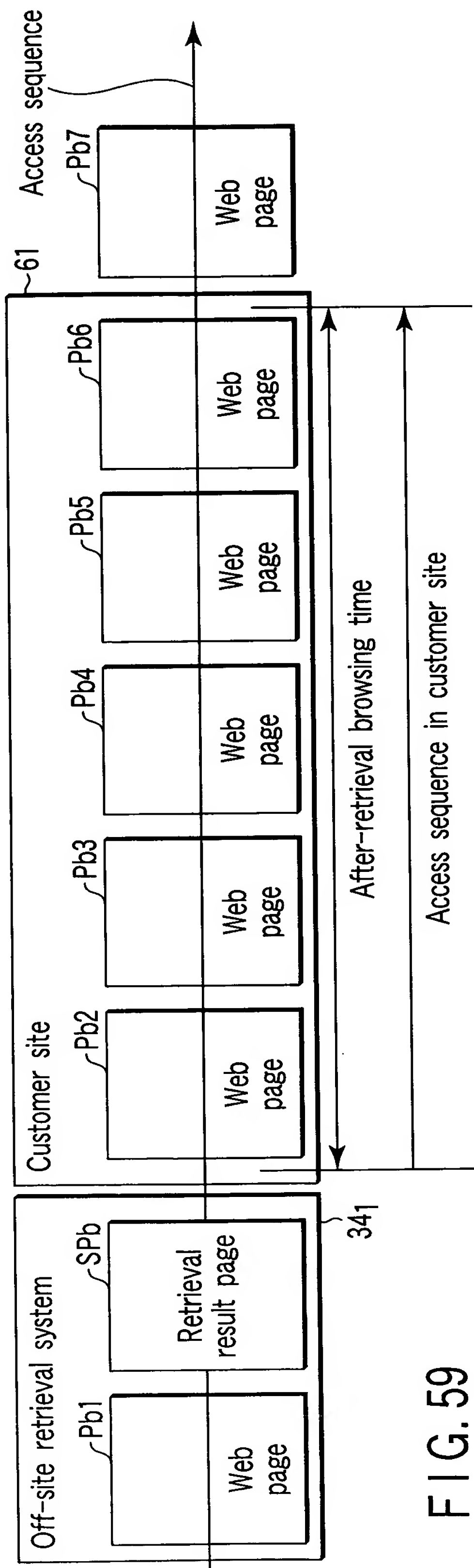


FIG. 59

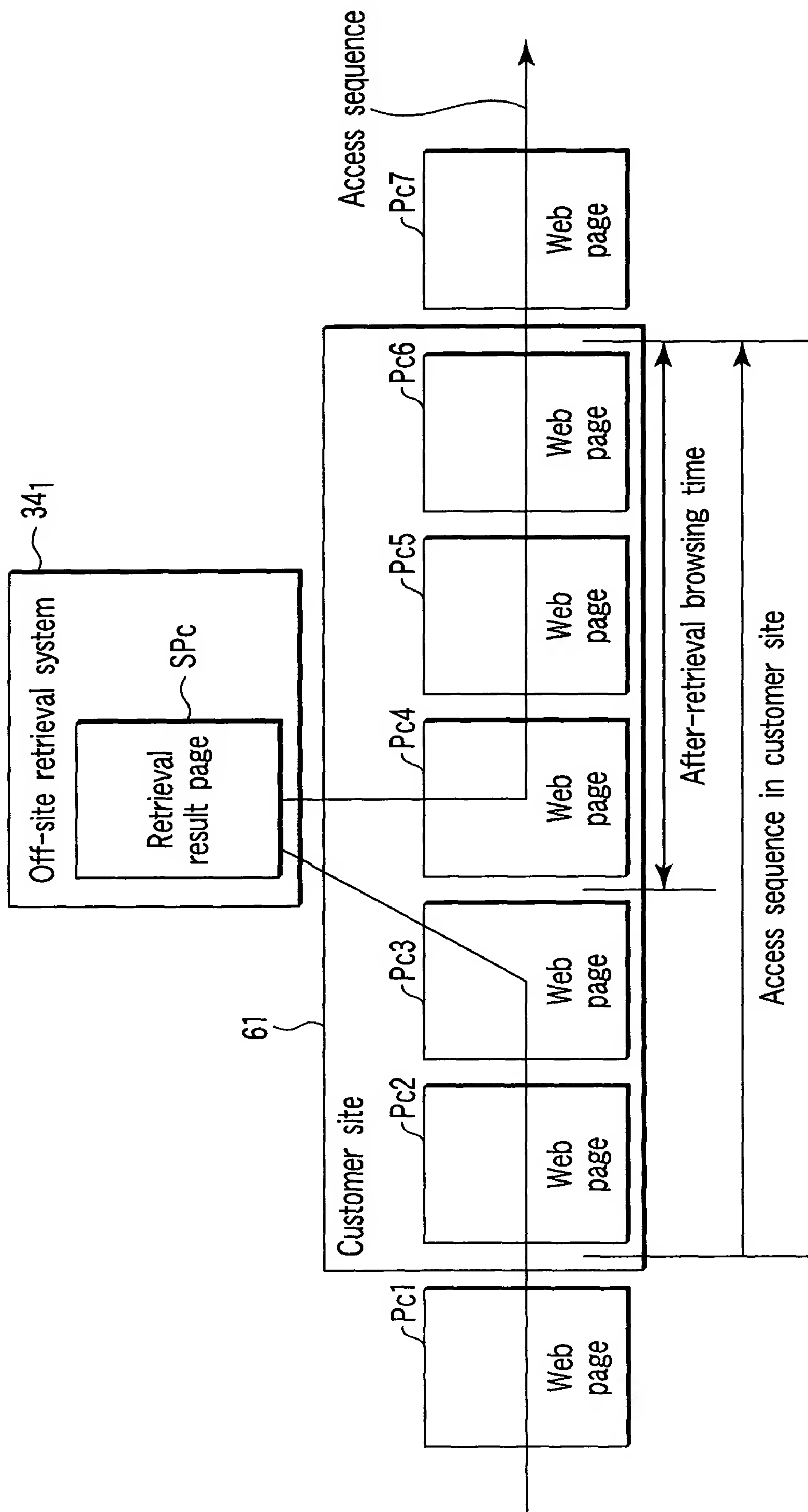


FIG. 60

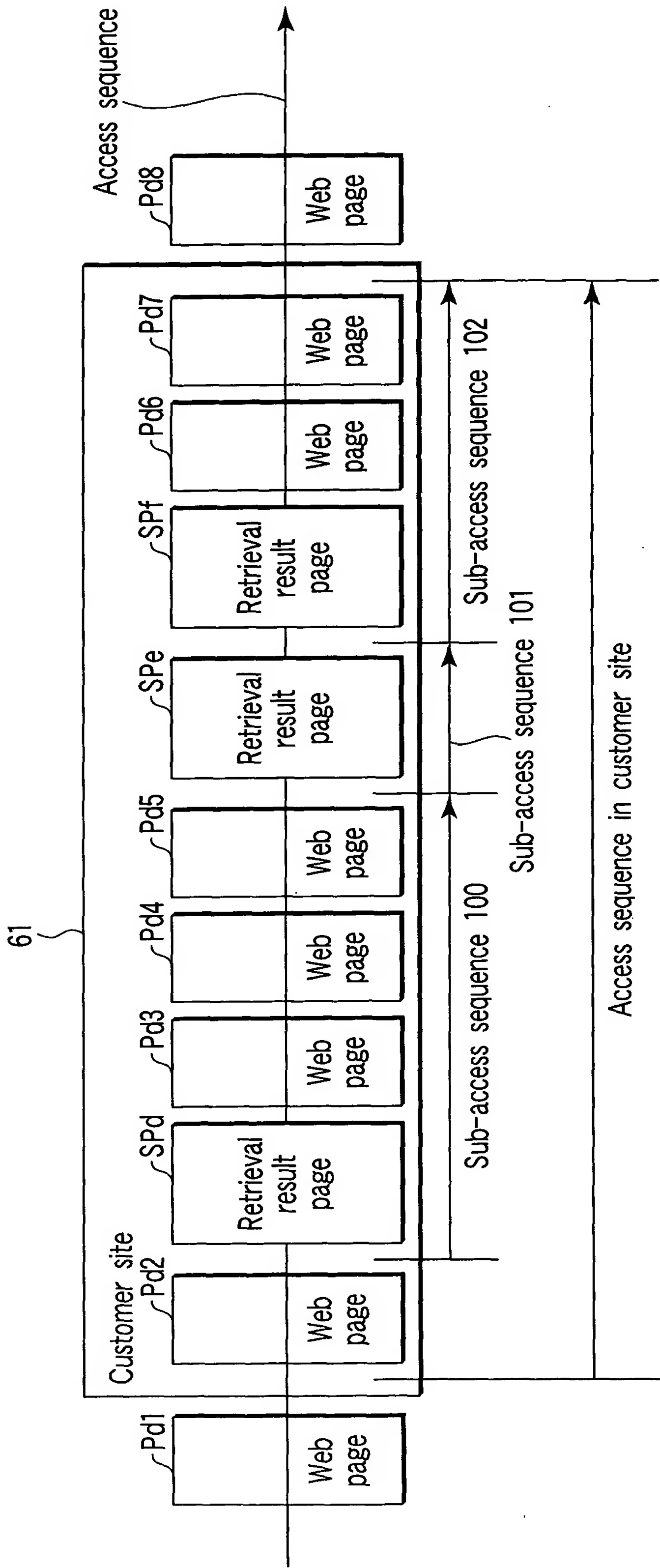


FIG. 61

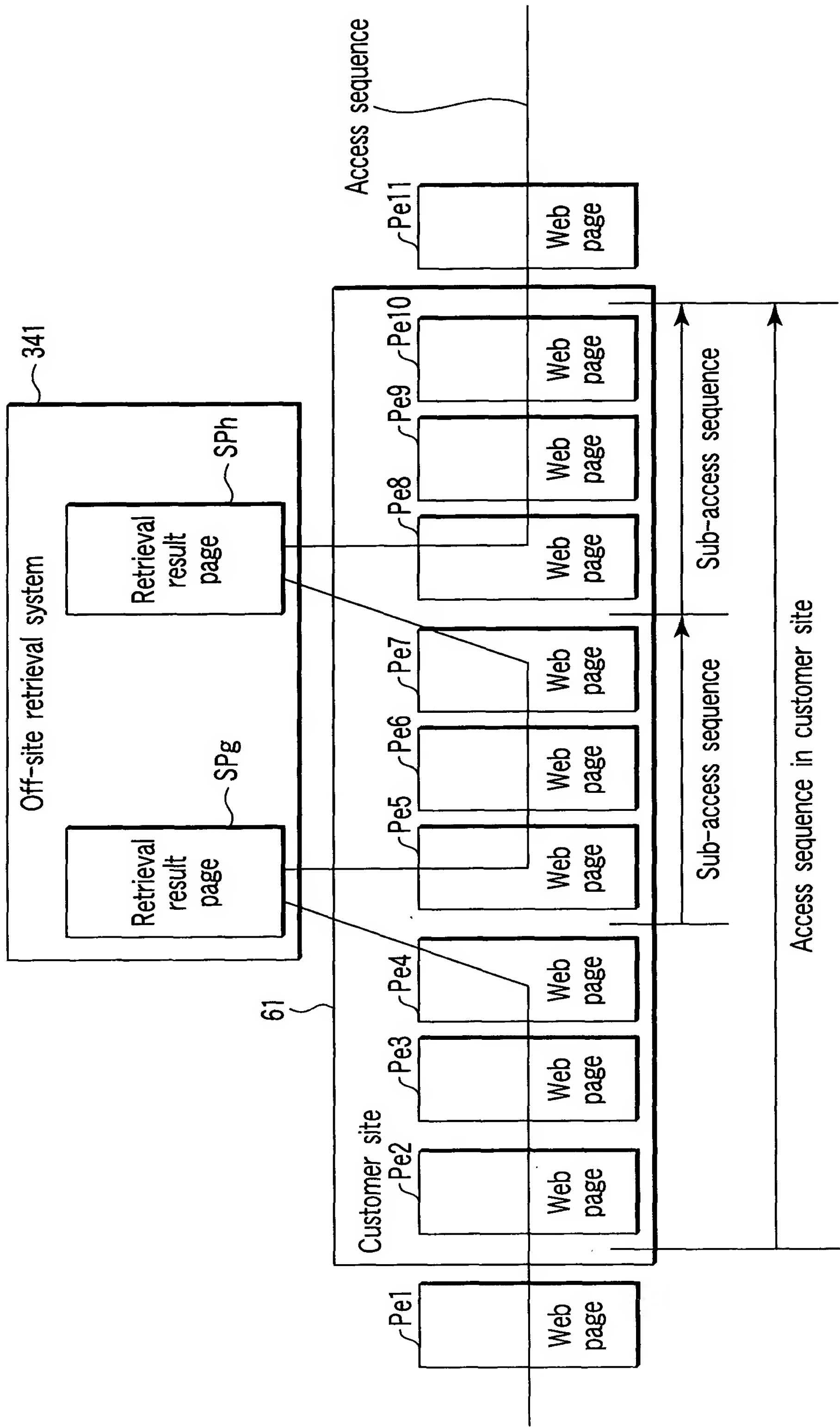


FIG. 62

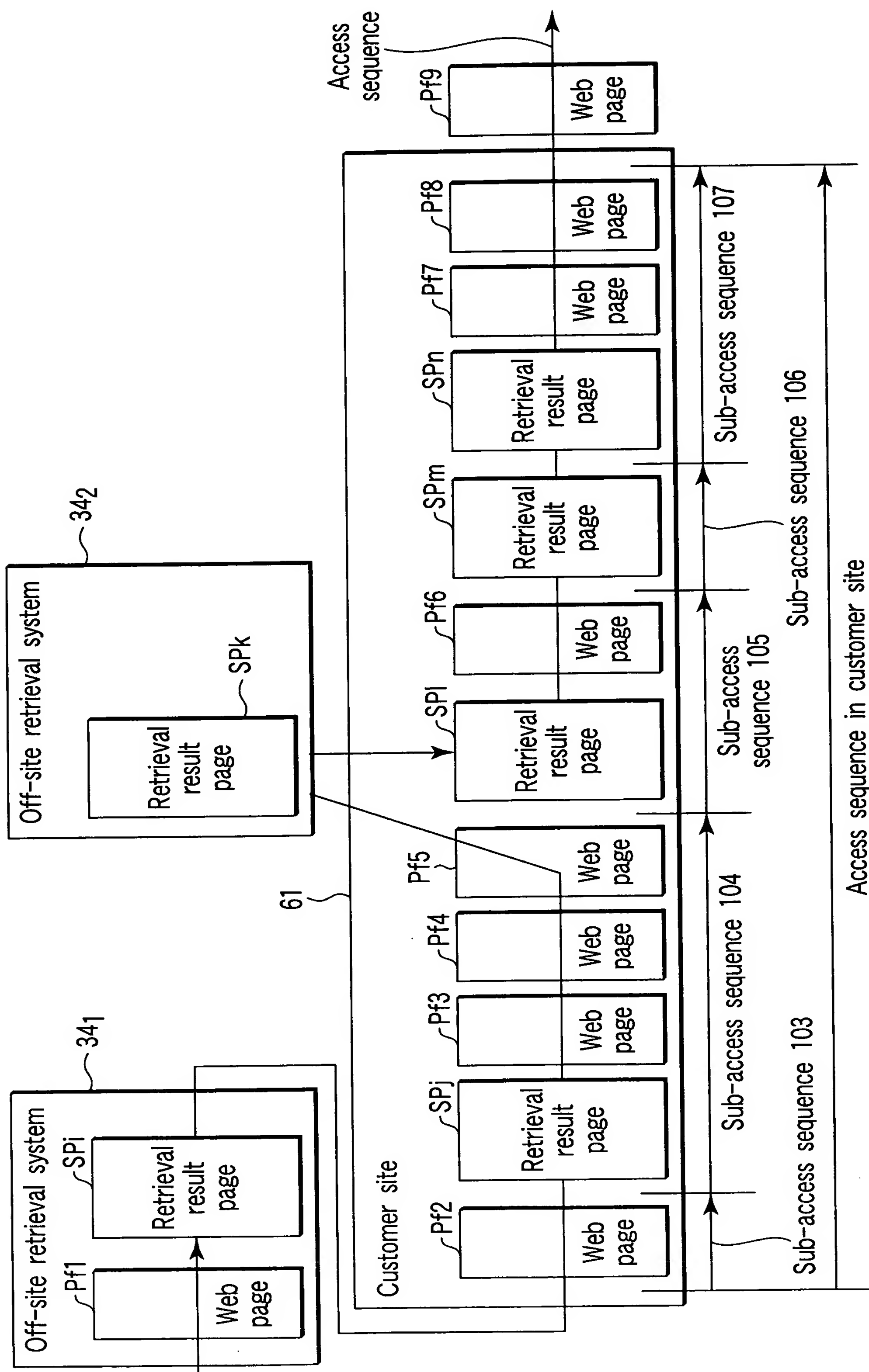


FIG. 63

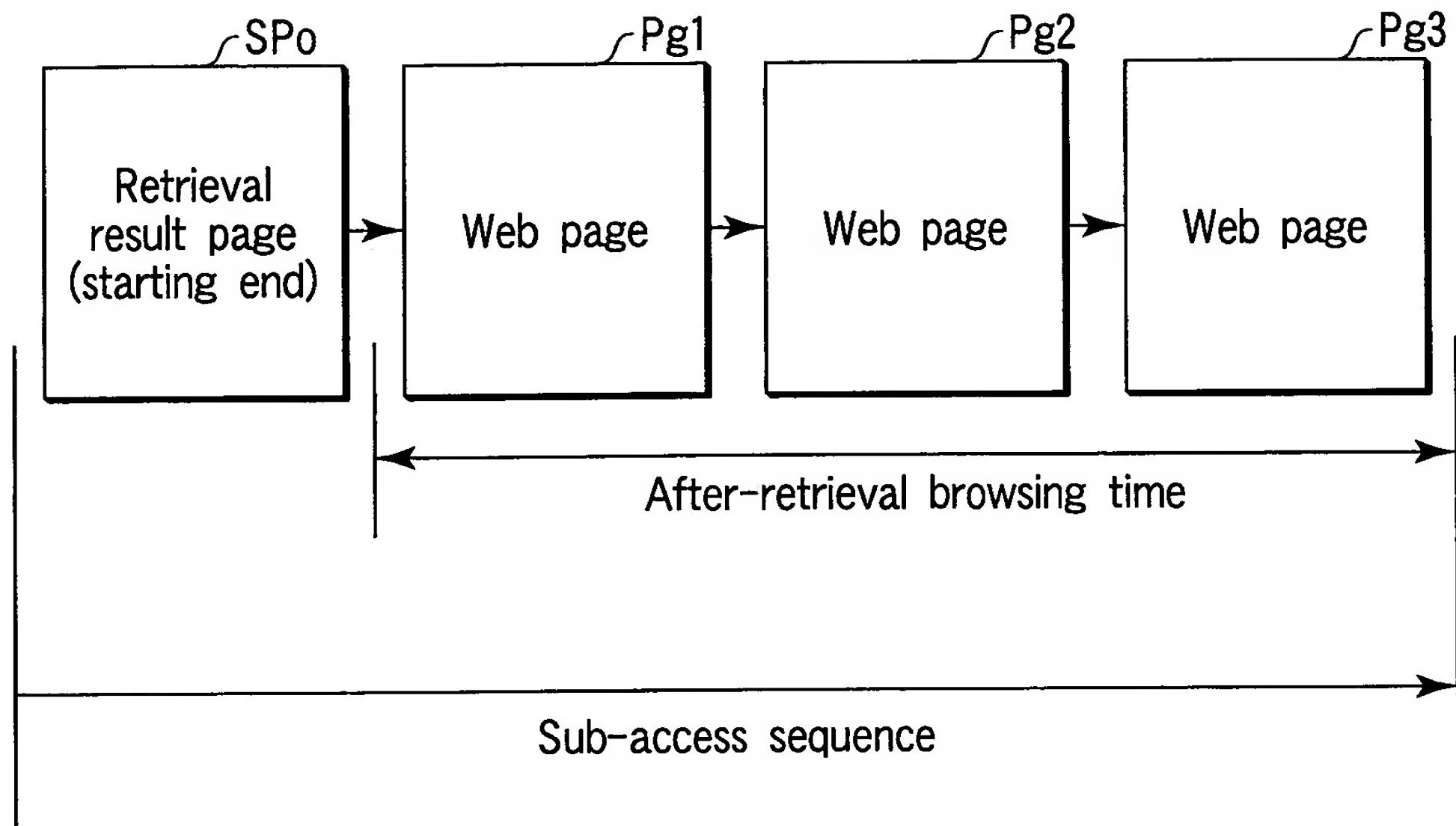


FIG. 64

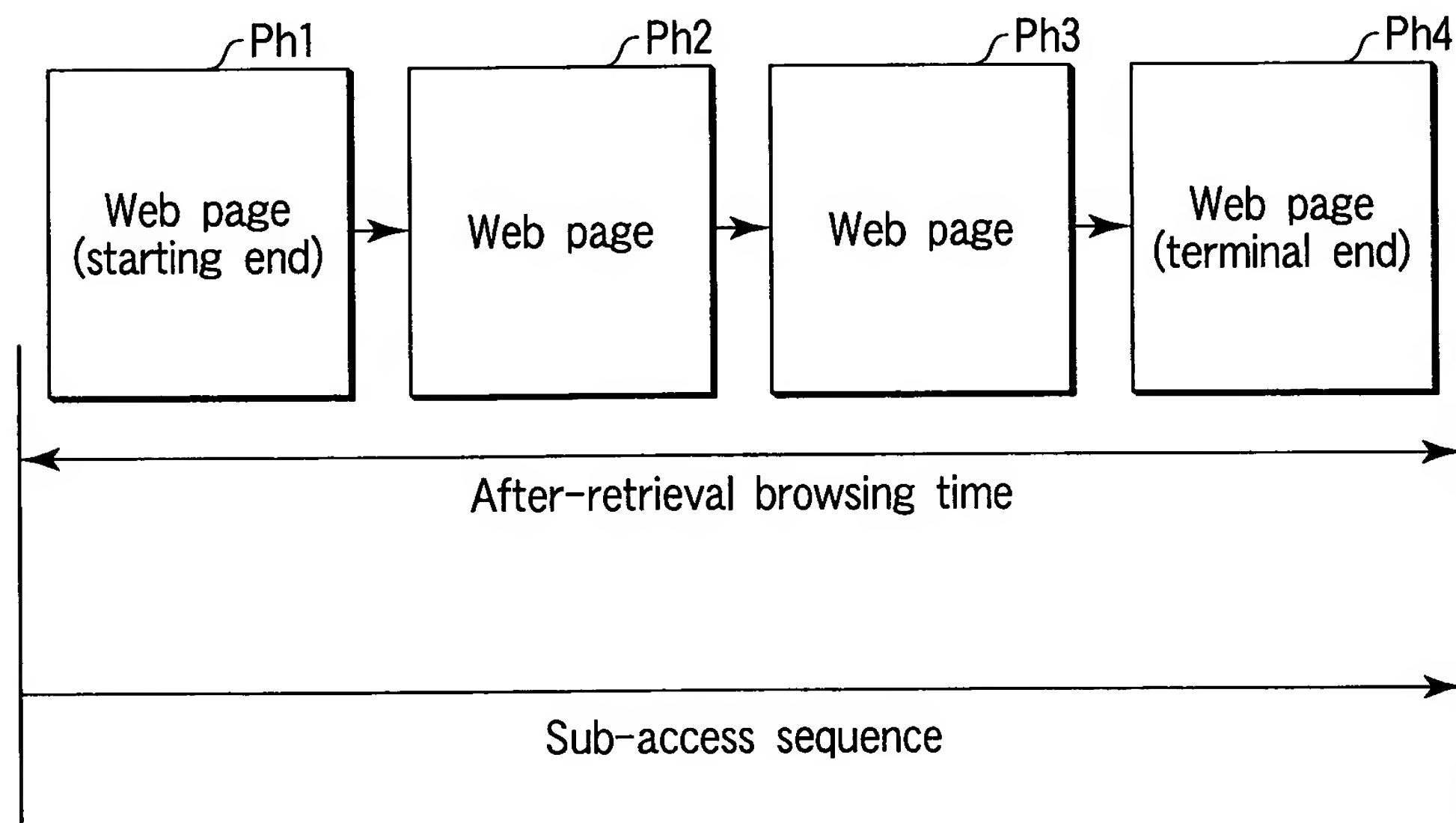


FIG. 65

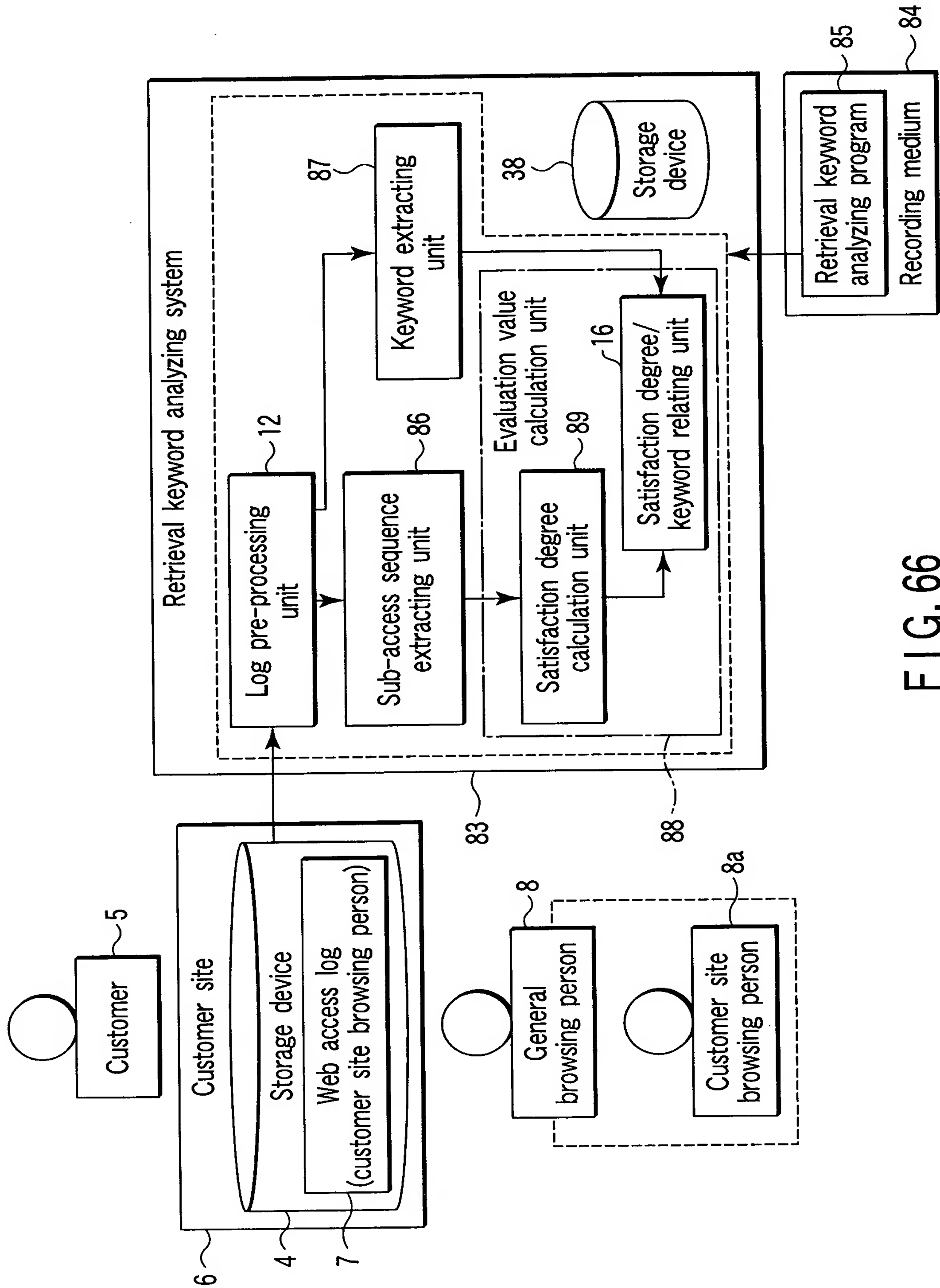


FIG. 66

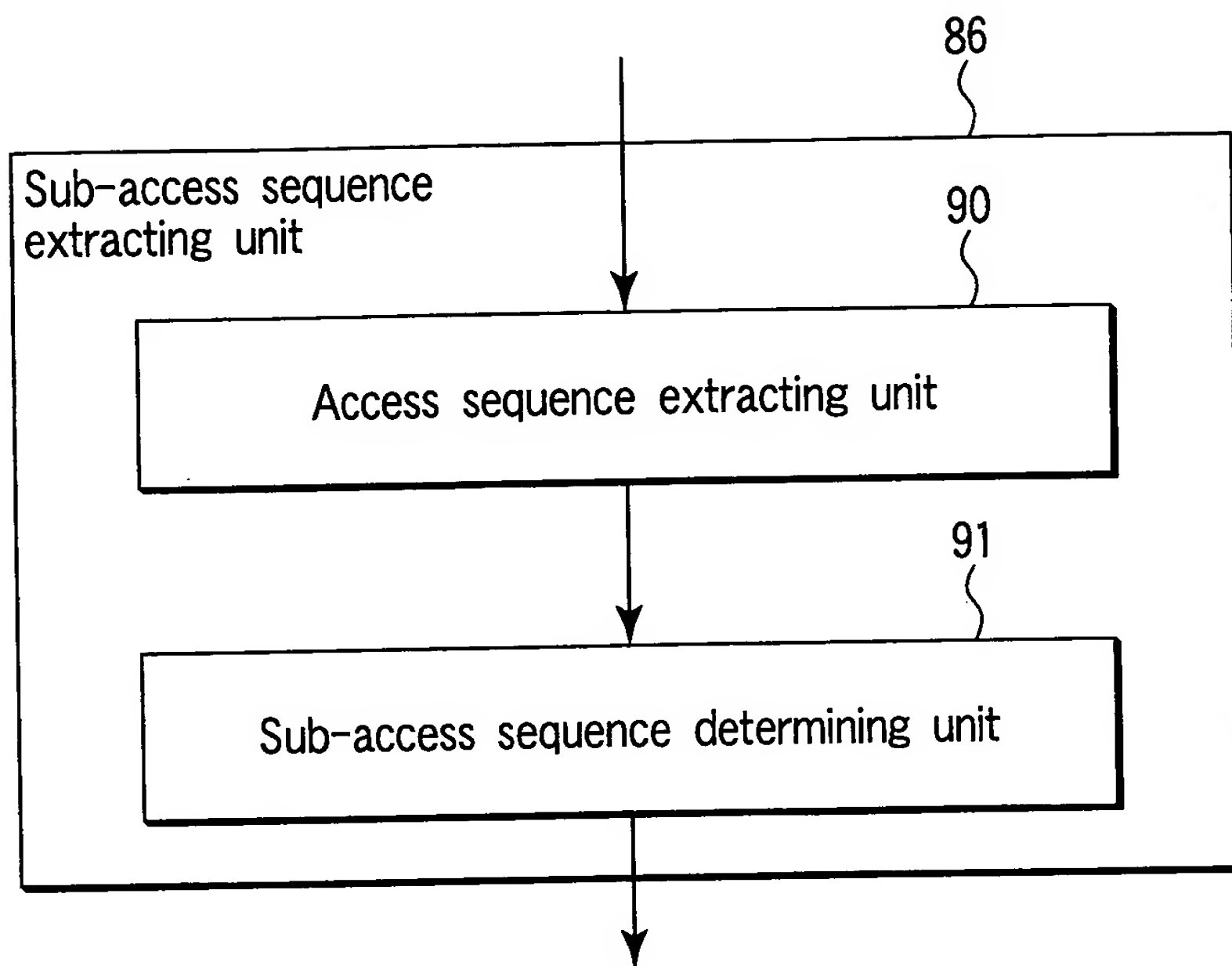


FIG. 67

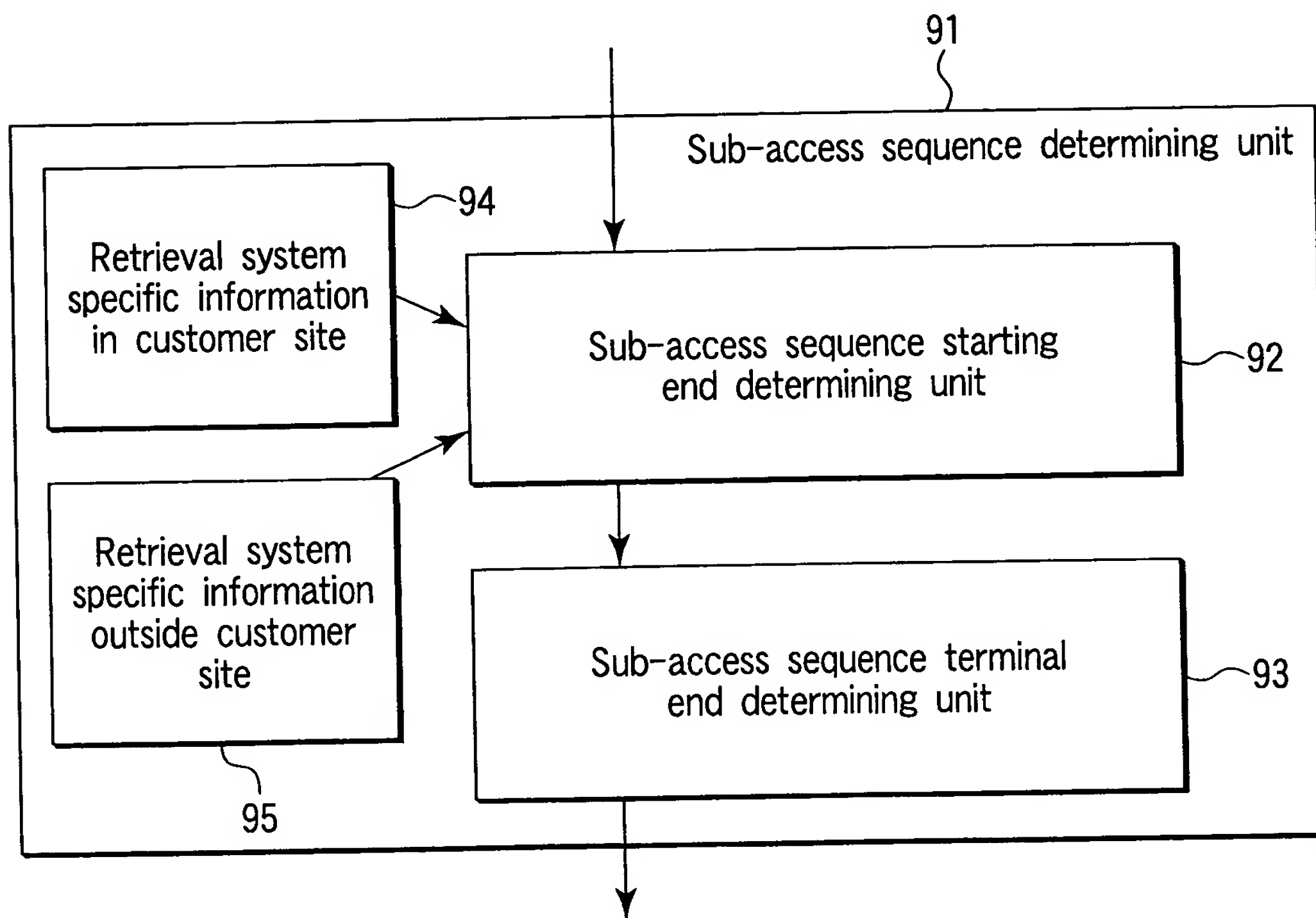


FIG. 69

Access sequence data

View ID	Visit ID	Visitor ID	Date	Time	Request	Reference information
View 1	Visit 1	Visitor 1	2002/2/14	18:56:14	/AAA.html	http://www.□□□.ne.jp/search.cgi?kw=vegetable
View 2	Visit 2	Visitor 2	2002/2/14	18:57:30	/BBB.cgi	—
View 3	Visit 1	Visitor 1	2002/2/14	18:58:01	/CCC.html	http://www.○○○.co.jp/AAA.html
View 4	Visit 2	Visitor 2	2002/2/14	18:58:40	/search.cgi?q=food	http://www.○○○.co.jp/BBB.html
View 5	Visit 1	Visitor 1	2002/2/14	19:59:10	/EEE.html	—
...

FIG. 68

Temporary first table

View ID	Visit ID	Visitor ID	Date	Time	Request	Reference information
View 1	Visit 1	Visitor 1	2002/2/14	18:56:14	/AAA.html	http://www.□□□.ne.jp/search.cgi?kw=vegetable
View 3	Visit 1	Visitor 1	2002/2/14	18:58:01	/CCC.html	http://www.○○○.co.jp/AAA.html
View 5	Visit 1	Visitor 1	2002/2/14	18:59:10	/EEE.html	http://www.○○○.co.jp/CCC.html
View 6	Visit 1	Visitor 1	2002/2/14	19:00:12	/search.cgi?q=food	http://www.○○○.co.jp/EEE.html
View 8	Visit 1	Visitor 1	2002/2/14	19:01:23	/FFF.html	http://www.○○○.co.jp/search.cgi?q=food
View 13	Visit 1	Visitor 1	2002/2/14	19:02:25	/GGG.html	http://www.○○○.co.jp/FFF.html
View 2	Visit 2	Visitor 2	2002/2/14	18:57:30	/BBB.html	—
View 4	Visit 2	Visitor 2	2002/2/14	18:58:40	/search.cgi?q=food	http://www.○○○.co.jp/BBB.html
...

FIG. 70

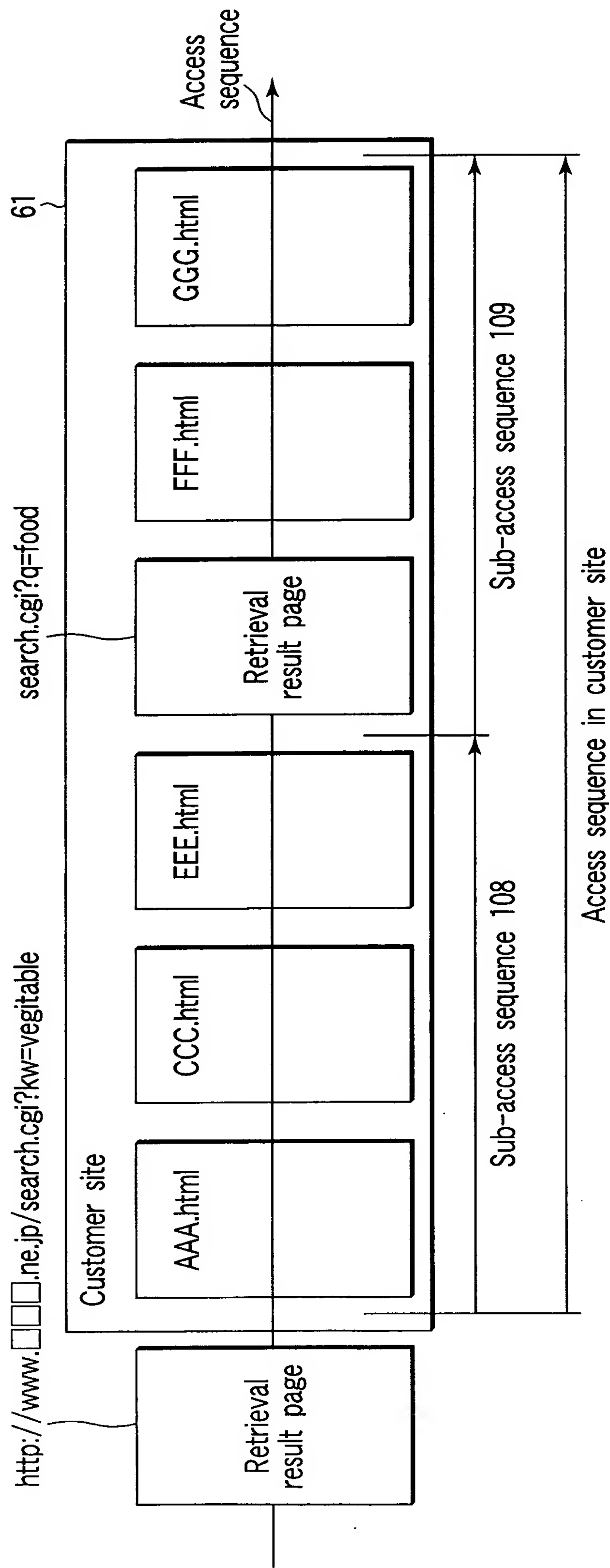


FIG. 71

Temporary second table

View ID	Visit ID	Visitor ID	Date	Time	Request	Reference information	Starting end flag
View 1	Visit 1	Visitor 1	2002/2/14	18:56:14	/AAA.html	http://www.□□□.ne.jp/search.cgi?kw=vegetable	1
View 3	Visit 1	Visitor 1	2002/2/14	18:58:01	/CCC.html	http://www.○○○.co.jp/AAA.html	0
View 5	Visit 1	Visitor 1	2002/2/14	18:59:10	/EEE.html	http://www.○○○.co.jp/CCC.html	0
View 6	Visit 1	Visitor 1	2002/2/14	19:00:12	/search.cgi?q=banana	http://www.○○○.co.jp/EEE.html	1
View 8	Visit 1	Visitor 1	2002/2/14	19:01:23	/FFF.html	http://www.○○○.co.jp/search.cgi?q=banana	0
View 13	Visit 1	Visitor 1	2002/2/14	19:02:25	/GGG.html	http://www.○○○.co.jp/FFF.html	0
View 2	Visit 2	Visitor 2	2002/2/14	18:57:30	/BBB.html	—	0
View 4	Visit 2	Visitor 2	2002/2/14	18:58:40	/search.cgi?q=food	http://www.○○○.co.jp/BBB.html	1
...

FIG. 72

Retrieval system specific information outside customer site

URL of retrieval system	Query pattern
http://www.□□□.ne.jp/	kw
...	...

FIG. 73

Temporary third table

View ID	Visit ID	Visitor ID	Date	Time	Request	Reference information	Starting end/terminal end flag
View 1	Visit 1	Visitor 1	2002/2/14	18:56:14	/AAA.html	http://www.□□□.ne.jp/search.cgi?kw=vegetable	1
View 3	Visit 1	Visitor 1	2002/2/14	18:58:01	/CCC.html	http://www.○○○.co.jp/AAA.html	0
View 5	Visit 1	Visitor 1	2002/2/14	18:59:10	/EEE.html	http://www.○○○.co.jp/CCC.html	2
View 6	Visit 1	Visitor 1	2002/2/14	19:00:12	/search.cgi?q=banana	http://www.○○○.co.jp/EEE.html	1
View 8	Visit 1	Visitor 1	2002/2/14	19:01:23	/FFF.html	http://www.○○○.co.jp/search.cgi?q=banana	0
View 13	Visit 1	Visitor 1	2002/2/14	19:02:25	/GGG.html	http://www.○○○.co.jp/FFF.html	2
View 2	Visit 2	Visitor 2	2002/2/14	18:57:30	/BBB.html	—	0
View 4	Visit 2	Visitor 2	2002/2/14	18:58:40	/search.cgi?q=food	http://www.○○○.co.jp/BBB.html	1
...

FIG. 74

Sub-access sequence data

View ID	Visit ID	Visitor ID	SubVisit ID	Date	Time	Request	Reference information	Off-site system flag
View 1	Visit 1	Visitor 1	SubVisit 1	2002/2/14	18:56:14	/AAA.html	http://www.□□□.ne.jp/search.cgi?kw=vegetable	1
View 2	Visit 2	Visitor 2	...	2002/2/14	18:57:30	/BBB.html	—	—
View 3	Visit 1	Visitor 1	SubVisit 1	2002/2/14	18:58:01	/CCC.html	http://www.○○○.co.jp/AAA.html	—
View 4	Visit 2	Visitor 2	SubVisit 3	2002/2/14	18:58:40	/search.cgi?q=food	http://www.○○○.co.jp/BBB.html	—
View 5	Visit 1	Visitor 1	SubVisit 1	2002/2/14	18:59:10	/EEE.html	http://www.○○○.co.jp/CCC.html	—
View 6	Visit 1	Visitor 1	SubVisit 2	2002/2/14	19:00:02	/search.cgi?q=banana	http://www.○○○.co.jp/EEE.html	0
...
View 8	Visit 1	Visitor 1	SubVisit 2	2002/2/14	19:01:23	/FFF.html	http://www.○○○.co.jp/search.cgi?q=banana	—
...
View 13	Visit 1	Visitor 1	SubVisit 2	2002/2/14	19:02:25	/GGG.html	http://www.○○○.co.jp/FFF.html	—
...

FIG. 75

Satisfaction degree data

View ID	SubVisit ID	Satisfaction degree
View 1	SubVisit 1	40
View 2	—	—
View 3	SubVisit 1	40
View 4	SubVisit 3	10
View 5	SubVisit 1	40
...

FIG. 76

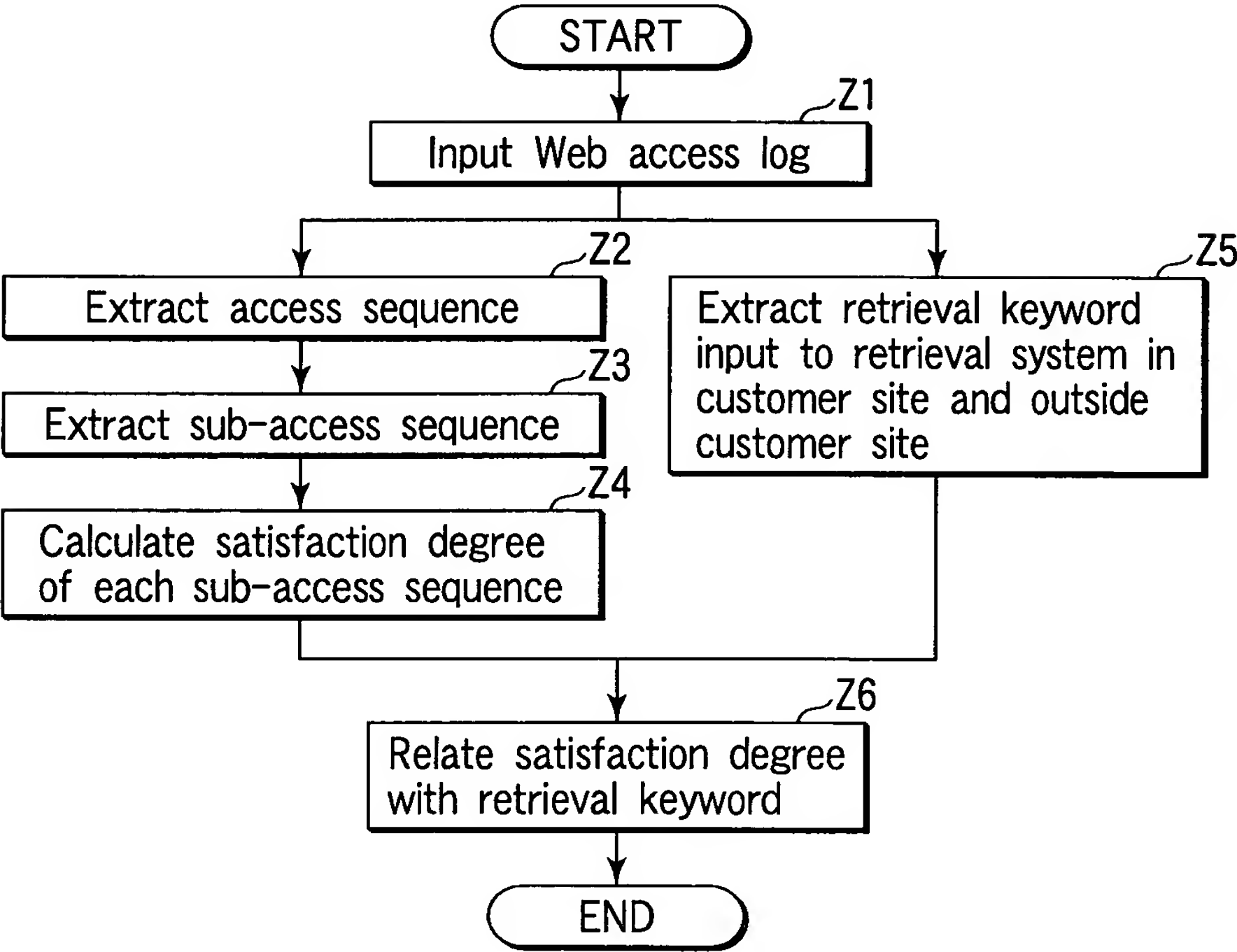


FIG. 77